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The American Cable Division maintains large stocks of all kinds of wire drilling lines in principal distributor warehouses and at district office warehouses located in all principal fields. American Cable's delivery service is immediate and accurate. All American Cable ropes made of improved plow steel are identified by the Emerald Strand.

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WILKES-BARRE, PENNSYLVANIA
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Regardless of the depth of well and hole condition, there's a type of Baker Shoe or Collar that will insure the *Safe Landing and Proper Cementing* of your casing string.

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For sales, service, or information, concerning Baker equipment, contact the nearest Baker office or representative. Complete details are given on pages 217 to 227—1941 Composite Catalog.

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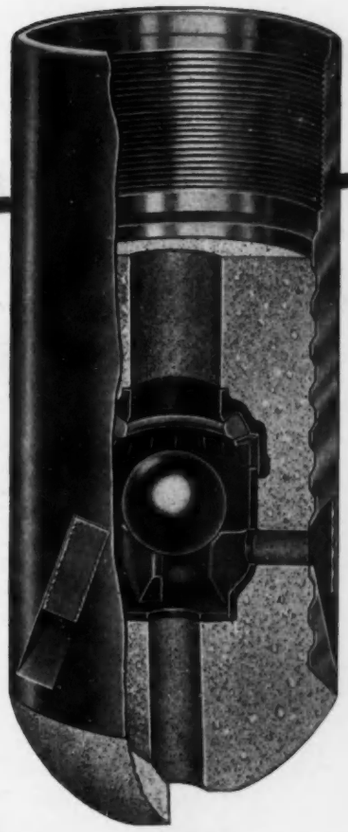

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(Product No. 120)

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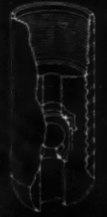
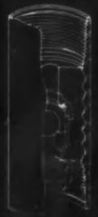
- ★ It affords easy drillability.



Baker Cement Float Shoe

Product No. 100



Baker Cement Float Collar

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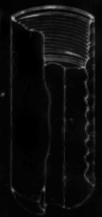

Baker Cement Guide Casing Shoe

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Baker Cement Wash-Down Whirler Float Shoe

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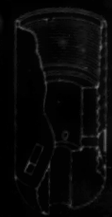

Baker Cement Wash-Down Whirler Guide Shoe

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Baker Cement Whirler Float Collar with Solid Bottom Baffle with Metal "Petal" Basket

Product No. 306

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Every day we meet men in oil companies who proudly wear their service pins. They should be proud for they have proved their ability, their stability, and their capacity for hard work. Their experience makes them valuable to their companies.

Likewise their companies evaluate highly the experience of other companies with whom they do business. The fact that Norvell-Wilder has earned its right to a 30 years service pin shows that its experience has spanned the period of greatest growth of the oil industry . . . experience in the largest and most active drilling, producing, and refining area on the globe.

OIL COMPANIES GET FROM NORVELL-WILDER:

- ★ **Cooperative effort which 30 years experience has proved to be the quality most desirable in a Supply House.**
- ★ **Quality products from large, conveniently located warehouses.**
- ★ **Quicker and more satisfactory service.**

NORVELL-WILDER SUPPLY COMPANY

LOOKING AHEAD

WITH THE EDITOR

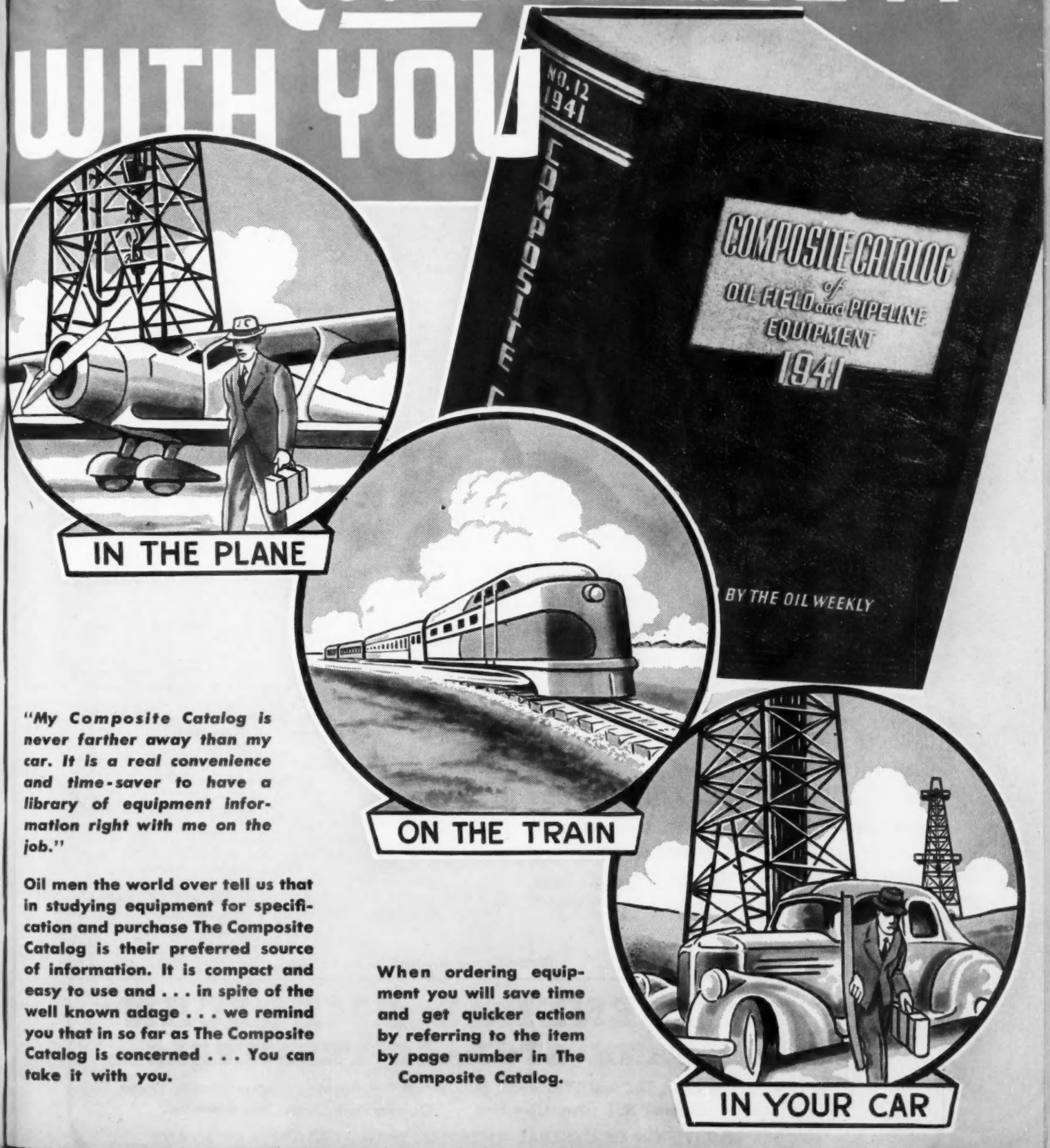
GEOLOGISTS AND GEOPHYSICISTS all over the country are planning at this time for the annual meeting of the AAPG and affiliated organizations to be held in Houston April 1 to 4 and a preview of the program shows that previous high standards in both technical and entertainment sessions will be exceeded. In keeping with the pace set last year your editors, likewise, plan to outdo themselves in the Annual Geological-Geophysical Number of THE OIL WEEKLY to be issued in conjunction with the big Houston meeting. To be specific here are a few subjects taken at random from the comprehensive editorial program being developed: Future Discovery Possibilities of the United States; Possibilities of Stratigraphic Exploration in Future Discoveries; Proper Organization and Administration of Geological Departments; Recent Progress in Geophysical and Geochemical Prospecting and Core Analysis. While dedicated to geologists and geophysicists, every article in this big special number will be interesting to everyone in the oil-producing industry.

DO YOU LIKE PICTURES? Almost everyone does and that is why your editors get a big kick out of giving you a pictorial feature like "Life on a Drilling Barge" (see this issue). Such a feature may not add a great deal to your technical knowledge but we are sure it will prove entertaining. That is why our editorial program calls for a number of strictly pictorial features this year. If you happen to be one of those poor deluded souls who think there is no romance or beauty to be found in this drilling and producing business you should start a scrap-book on these pictorial features. But you better watch out or the photo-bug will get you . . .

SOUTHWEST TEXAS or South Texas, as the district west of the Colorado and South of Austin is variously called, is a region including 60 counties. Since things have been comparatively quiet down that way, only 245 rigs were busy on the last count, while oil, gas or distillate were being produced from 338 fields. Estimated reserves in these fields yet to be produced is nearly a billion and a half barrels, or nearly eight percent of the total of such reserves for the United States. Nature of development during the recent past indicates that further discoveries are to be anticipated in some of the wide stretches included within the area. New sands and extensions to existing fields are a weekly occurrence. All these combine to make South Texas a most important oil area. With this in mind, we propose to present next week a review of the area. Included will be tabulations showing field development, producing depths and where the potential reserves are located.

The OIL WEEKLY, published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

YOU *Can* TAKE IT WITH YOU



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Oil men the world over tell us that in studying equipment for specification and purchase The Composite Catalog is their preferred source of information. It is compact and easy to use and . . . in spite of the well known adage . . . we remind you that in so far as The Composite Catalog is concerned . . . You can take it with you.

When ordering equipment you will save time and get quicker action by referring to the item by page number in The Composite Catalog.

You'll find it . . . quickly . . . in

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These five General American Terminals didn't just happen to be spotted where they are. Each location was chosen for special, strategic reasons. Each site embodies outstanding economies in freight rates and shipping facilities for every producer of bulk liquids. Each General American Tank Storage Terminal, of course, gives you seven exclusive advantages . . . advantages that are yours without a penny's investment on your part. See what you get and then see General American before you make another shipment!

Only General American Gives You All These Advantages

1. **NO CONTAMINATION.** Separate pumps, lines, storage zones for dissimilar commodities.
2. **MODERN PROTECTION.** Latest safety appliances; lowest insurance rates, minimum evaporation losses.
3. **RELIABLE CUSTODIANSHIP.** Our warehouse receipts are highest type of collateral everywhere.
4. **INDEPENDENT OWNERSHIP.** Strictest privacy; we do not buy, sell or refine any commodities.
5. **NO WHARFAGE.** There is no wharfage charge at our own private docks.
6. **SPEED WITH SAFETY.** Day and night crews, complete facilities, eliminate all shipping delays.
7. **WORLD'S LARGEST TANK CAR FLEET.** One car or hundreds, wherever and whenever needed.

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A DIVISION OF GENERAL AMERICAN TRANSPORTATION COMPANY

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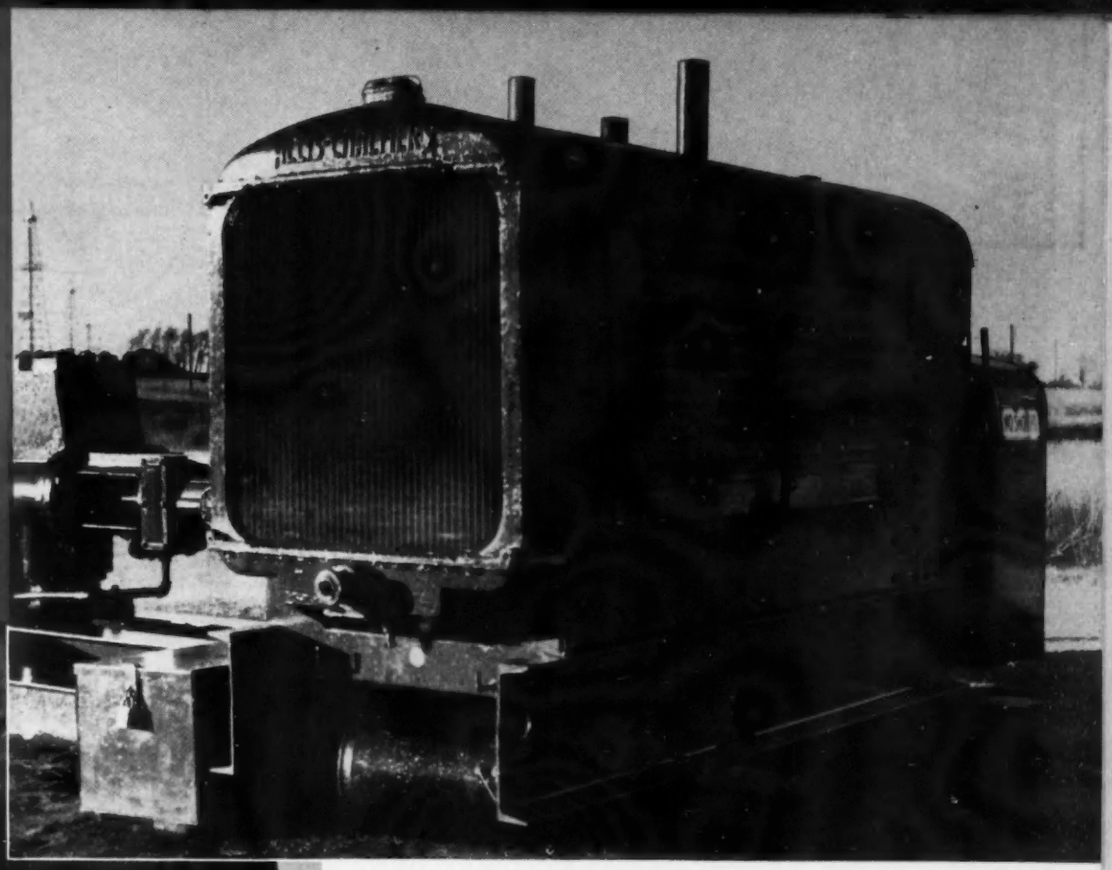

(Upper photo) MODEL L unit driving heavy duty pipe line pump
(Lower photo) MODEL B unit, natural gas fuel on pumping well in Kansas field

The RIGHT SIZE POWER

When you choose a power unit, select one that will fulfill the power requirements of the well during its productive life—Don't Over Power—Don't Under Power—There's an A-C unit built to give you low cost, uninterrupted service.

Check your power requirements closely, or if you desire a recommendation, with no obligation, one of our power engineers will be glad to assist you.

Allis-Chalmers power units are delivered complete with accessories: fan, water pump, air cleaner, and oil filter. They are ready to run when delivered. Every unit is equipped with a centrifugal type variable speed governor.

MODEL L—6 cylinders, 5¼" bore, 6½" stroke. Continuous operating range 500-1200 r.p.m. Torque 590 ft. lbs. **MODEL E**—4 cylinders, 5¼" bore, 6½" stroke. Continuous operating range 600-1200 r.p.m. Torque 400 ft. lbs. **MODEL U**—4 cylinders, 4½" bore, 5" stroke. Continuous operating range 700-1200 r.p.m. Torque 200 ft. lbs. **MODEL W**—4 cylinders, 4" bore, 4" stroke. Continuous operating range 800-1300 r.p.m. Torque 128 ft. lbs. **MODEL B**—4 cylinders, 3¼" bore, 3½" stroke. Continuous operating range 900-1400 r.p.m. Torque 74 ft. lbs.

Allis-Chalmers engines burn gasoline, natural gas, or distillate

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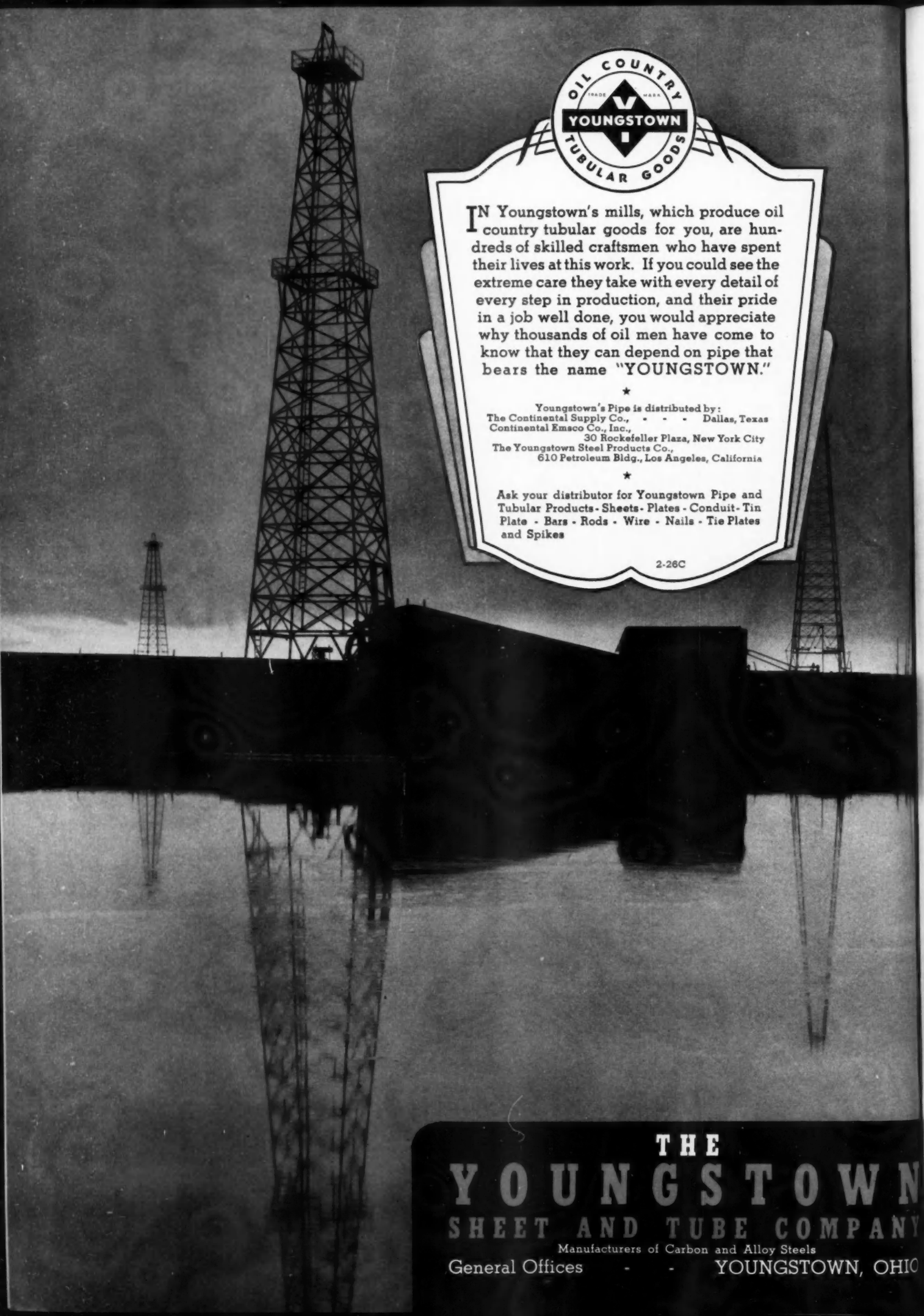
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TUBULAR GOODS
IN Youngstown's mills, which produce oil country tubular goods for you, are hundreds of skilled craftsmen who have spent their lives at this work. If you could see the extreme care they take with every detail of every step in production, and their pride in a job well done, you would appreciate why thousands of oil men have come to know that they can depend on pipe that bears the name "YOUNGSTOWN."
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THE OIL WEEKLY

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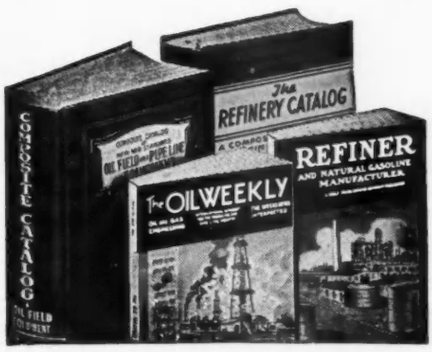

SPECIALIZED OIL JOURNALS

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The Oil Man's Calendar

MAR.	
7	**American Petroleum Institute, Illinois Basin Chapter, Mt. Vernon, Illinois.**
11	**American Petroleum Institute, Division of Production, Spring Meeting, Pacific Coast District, Los Angeles.**
APR.	
1– 3	**Society of Exploration Geophysicists, Houston.**
2– 4	**American Association of Petroleum Geologists, Twenty-sixth Annual Meeting, Houston.**
3– 4	**Society of Economic Paleontologists and Mineralogists, Houston.**
7–11	**American Chemical Society, St. Louis.**
15–17	**Southwest Gas Measurement Short Course, University of Oklahoma, Norman.**
16–18	**Western Petroleum Refiners Association, Hot Springs, Ark.**
17–18	**American Petroleum Institute, Division of Production, Eastern District, Pittsburgh.**
23–25	**Petroleum Industry Electrical Association, Tulsa.**
23–25	**Natural Gasoline Association of America, Dallas.**
24–25	**National Petroleum Association, Semi-Annual Meeting, Cleveland.**
MAY	
2– 3	**Petroleum and Natural Gas Conference, State College, Pa.**

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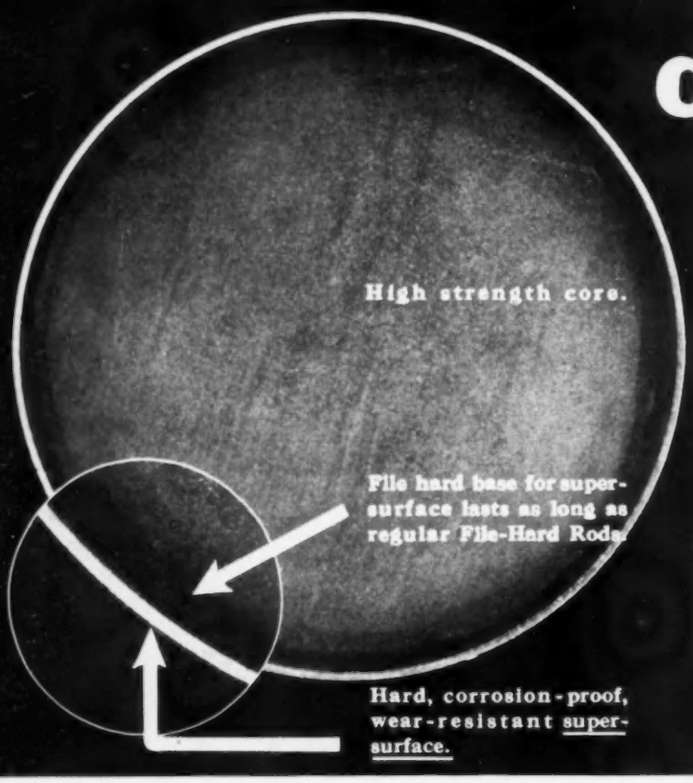
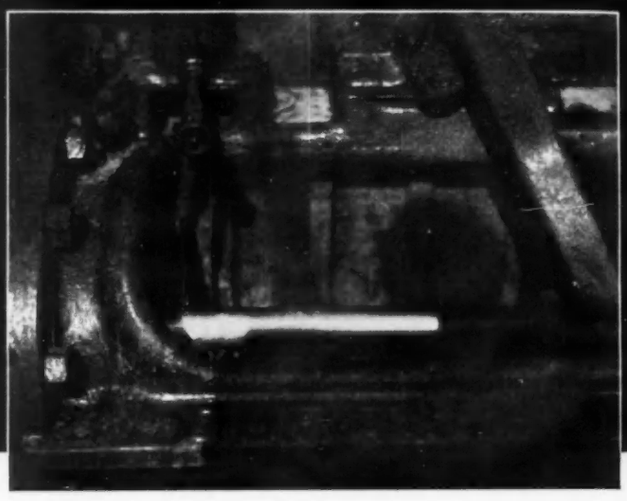
Corrosion-proof Piston Rods


High strength core.
File hard base for super-surface lasts as long as regular File-Hard Rods
Hard, corrosion-proof, wear-resistant super-surface.

ACTUAL PHOTO OF AN ETCHED CROSS-SECTION OF A MISSION *SUPER-SURFACED* PISTON ROD.



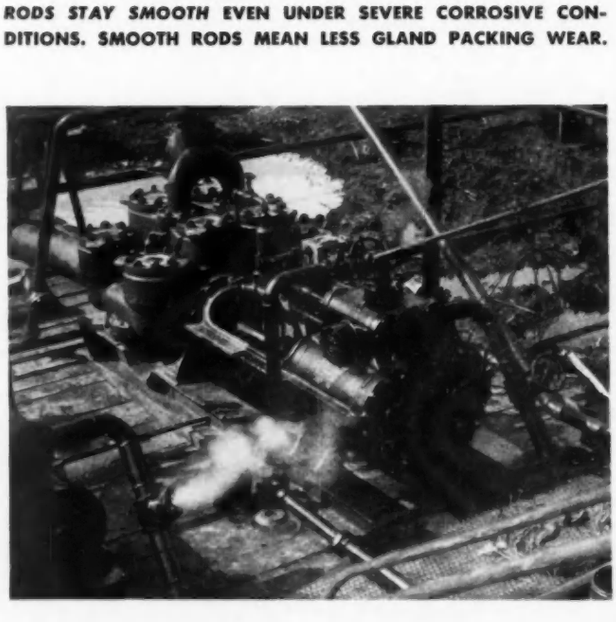
RODS STAY SMOOTH EVEN UNDER SEVERE CORROSIVE CONDITIONS. SMOOTH RODS MEAN LESS GLAND PACKING WEAR.

This hard, corrosion-proof super-surface on Mission Super-Surfaced Piston Rods . . . doubles rod life under ordinary conditions . . . gives three to four times longer life under corrosive conditions.

These rods give extremely long life and freedom from rod and packing troubles at a *lower replacement cost per foot of hole drilled*. They last at least twice as long as file hard rods—thus making the 45% additional cost a very good investment.

Guaranteed against breakage: The Mission Piston Rod guarantee protects you from damage to your pumps caused by breakage of a Mission Piston Rod when equipped with a Mission Piston of the proper taper and a Mission Self-Sealing Gland Packing.

Install Mission Super-Surfaced Piston Rods. Keep cost records and see why we say they are the most economical rods on the market—regardless of price. Mission Manufacturing Company, Houston, Texas. Export Office, 30 Rockefeller Plaza, New York.

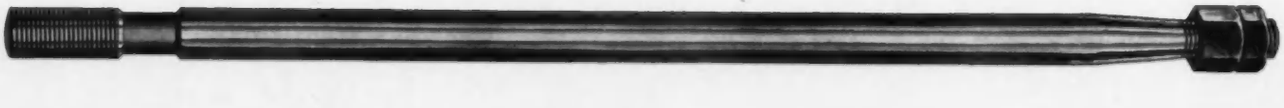


YOUR PUMPS ARE MORE DEPENDABLE WHEN LONG-LIFE MISSION *SUPER-SURFACED* PISTON RODS ARE USED. . . . LONGER WEAR MEANS LESS SHUT DOWN TIME.

MISSION

SLUSH PUMP PARTS

Your pumps stay running longer and cost less to repair when equipped with Mission Pump Parts



THE OIL WEEKLY

MARCH 3, 1941

VOLUME 100 NUMBER 13

The Changing Panorama

MANUFACTURERS who supply oil industry equipment are beginning to find difficulty in securing certain materials for use in oil-country equipment. Others, who manufacture equipment which is used by the Army and Navy are finding it increasingly difficult to provide the oil industry with that portion of their product which the industry needs.

The government should take cognizance of the fact that to maintain the present plentiful supply of oil, the oil industry finds it necessary to drill a great many wells annually; and that in the refining industry the modern plant is in a constant state of rebuilding.

Last year the industry drilled 30,560 wells. This year, according to plans of a fair cross section of large and small companies, and according to field reports compiled by editors of THE OIL WEEKLY, the industry plans to drill somewhat less wells—but it is entirely possible that by the middle of the year the industry may find it advisable to increase the number of wells planned at the beginning of the year.

The government should take into consideration that, while the industry could materially increase its production for a reasonable period without additional drilling, this is a procedure which would not be wise, and that with heavy increases in consumption in prospect, ***normal drilling should be continued.*** To do this will mean that the necessary bureau allocate to oil-well equipment and refining equipment manufacturers sufficient raw materials to meet the industry's necessity.

This should be done promptly and it is to the interest of the industry as a whole that the manufacturers and the oil companies, if necessary, cooperate in a memorial before it is so late that a re-allocation would disturb plans made by the government.

Oil Shows . . .

Action of the Oil-World Exposition in postponing the next Houston oil show until the spring of 1943 will meet with general approval of oil men and manufacturers.

Certainly in these troubled times the idea of two expositions within a month of each other did not make sense. The reasons advanced by President John R. Suman, in presenting to the membership of Oil-World Exposition the recommendation of the exposition's executive committee, not only appeared to be sound to the membership (composed of oil men and exhibitors) but will appeal to oil men and manufacturers generally. These reasons included: inability of the Houston group to get the Tulsa group to fit into a plan of one show in Tulsa and one show in Houston in each four-year period; unwillingness of operators to send their men to two shows during the same year; unwillingness of manufacturers to have two exhibits in one year; need for further improvement of exhibition facilities in Houston before holding the next show; the changed international situation, and finally the defense situation.

Miscellany . . .

An interesting sidelight on the diplomatic situation in one Latin-American republic: the ambassador there is a fine man, highly regarded by those acquainted with his work. Yet the ambassador has the feeling that certain American interests there do not take him into their confidence. Discreet inquiry as to whether or not the American interests have taken him fully into their confidence reveals that some of them have not recently. Reason: while the ambassador is a most discreet gentleman, his wife, with whom he frequently discusses affairs, does not appear to be so discreet. Result: business secrets given to the ambassador in the past by American interests have been discovered to be tea-table conversation at a slightly later date—and the American interests are afraid to talk! . . . To the gentleman who inquired if the photograph of President Camacho, and box which accompanied the article on Mexico last week, meant that President Camacho wrote the article—the answer is "NO!" . . . Query: "Is there anything to the report that when John Suman made his debut as president of AIME in New York last week, he had a copy of his speech in every pocket?" Answer: No, he did not have a copy in each pocket. He only had copies in three pockets . . . At least one large operator does not agree with the figures which THE OIL WEEKLY and other publications have presented showing that a big increase in domestic production can be had simply by cracking valves. Says he, preferring to be anonymous, "I think that you are all wet in your figures. You are not taking into account the water trouble which would arise if you increased production in some areas. Where is all that increase you have said could be had in Kansas? North Texas production is slipping like nobody's business." . . . And not long after we had talked to him, we were told by another man, "I don't hear of any pipe-line company cutting loose from crude connections. The situation in Louisiana and Arkansas is such that some people wouldn't be surprised by a price increase." . . .

H. H. POWER

THE authors discuss physical and chemical characteristics of "heaving shales"; and methods which have been used for controlling troublesome beds encountered are summarized. Research is suggested for a progressive examination of bentonites and extension of procedures developed to more complex samples secured from wells experiencing trouble. Mr. Power is chairman of the Subcommittee on Heaving Shale of the API Topical Committee on Production Technology and is chairman of the Petroleum Production Department of the University of Texas. Mr. Houssiere is working toward his doctor's degree in Petroleum Engineering and Geology and is Research Assistant, Bureau of Engineering Research, University of Texas. While the paper is based upon studies made by the subcommittee of the API, it is not an official report. It was presented before the Southwestern District API Division of Production, Shreveport, February 27-28, 1941.

C. R. HOUSSIERE, JR.

A Preliminary Survey of the

Heaving Shale Problem

By
H. H. POWER
and
CHAS. R. HOUSSIERE, JR.

FORMATIONS variously designated as "heaving shale," "sloughing shale" and "caving shale" impede and may even preclude drilling in various areas, and particularly in certain parts of the Gulf Coast. Operators hesitate to attempt to drill to great depth in areas where these formations are known to exist, since there is a certainty that the drilling operation will be slow and costly at best, and there is a strong probability that the "heaving shale" will defeat all attempts to reach formations that may underlie it. Development of effective, dependable methods for drilling through these troublesome beds, it is believed, would comprise a major contribution to drilling technology and to the task of finding and developing our undiscovered oil pools.

Great pressures are encountered in deep wells, and particularly in wells located on the steeply plunging flanks of salt-dome structures. It has been suggested that gliding or slipping of these steeply tilted beds is a major cause of the movement of shales into bore holes. It has also been noted that shales which contain bentonite absorb water from drilling fluids, swell, and thereby develop pressure which squeezes or "heaves" the shale into a well.

Some operators have reported that certain shales contain large volumes of gas under extremely high pressure. Pressure relief provided by the bore hole allows such gas saturated shales to be blown into the hole with drastic consequences. Other operators have described a so-called plastic flow at considerable depth. They have postulated one essential difference between a shale which flowed plastically, and one which swelled due to hydration: as the plastic flow continued, its fluidity was thought to increase, and flow became progressively worse.

Many artificial causes have been assigned to the heaving shale problem. It has been stated as a general premise that any mechanical operation in the drilling of a well which caused a differential in pressure between the troublesome formation drilled and the bore hole, was liable to promote movement of the shale into the latter. This pressure differential may be caused by so-called "swabbing action" incident to removal of drill pipe and bit from the hole. It may be caused by incorrect drilling rate, or rate of circulation of the drilling fluid. Drilling fluids become less dense, due to dissolved gas, and promote the unbalance in reservoir pressure. The list may be extended at length. In some cases it has not been entirely clear whether interruptions to drilling operations were due to "heaving shale" rather than to some other difficulty.

Regional Studies

It is not enough for the operator to know the geological horizons embracing heaving shales. He also should know the areal distribution of the heaving type of shales along certain trends or belts. This knowledge enables him to estimate the approximate depth of the heaving-shale section, prepare suitable drilling fluid, and arrange all mechanical details necessary to insure satisfactory penetration of the troublesome formations.

Most of the heaving shale found in the Gulf Coast occurs in fairly well defined and recognized areas. The evidence has at least partially substantiated the idea that there are certain strike lines where heaving shale is more prevalent than along other strike lines of the stratigraphic unit. While up-dip limits may be determined by strike for certain classifications, down-dip limits are defined by drilling depths. It has been noted in the Gulf Coast area that in each in-

stance heaving shale was found along a trend where the best sand development of the stratigraphical horizon occurred up-dip, and down-dip facies changed from a sand to a shale.

Three definite heaving shale belts have been designated in the Texas-Louisiana Gulf Coast areas: (1) the Miocene-Oligocene, (2) the Jackson, and (3) the Yegua. Heaving shale is found particularly in the drag sections on piercement-type salt domes, where many Gulf Coast wells are located as Frio tests. These are situated close to the flanks of domes where the Vicksburg shales are thought to overlie the salt. It has been noted further that heaving frequently occurs on one side of a dome and not on another. It may occur on the crest and flanks of a dome and not around its peripheries.

Types of Heaving Shale

Although the term "heaving shale" has been applied generally to shales in which serious drilling difficulties have been encountered, yet it has not been established that there are essential differences between the so-called "caving," "sloughing," "heaving" and other troublesome shales.

Heaving shales generally are characterized by certain individual properties, but it is not definitely established that they can be positively identified by any of them.

In general, shales may be classified as arenaceous, argillaceous, siliceous, ferruginous, gypsiferous, carbonaceous, bituminous and glauconitic. From numerous studies of various heaving shales it is apparent that bentonite is present in large or small quantities and the bentonitic character of shales is reputed to be a major influence accounting for their inordinate tendency to heave.

C. S. Ross[1] quotes a previous reference[2] in defining bentonite: "Bentonite is a rock composed essentially of a crystalline, clay-like mineral formed by the devitrification and the accompanying chemical alteration of a glass igneous material, usually a tuff or volcanic ash and it often contains variable proportions of accessory crystal grains that were originally phenocrysts in the volcanic glass . . . The characteristic clay-like mineral has a micaceous habit and facile cleavage, high birefrigence and a texture inherited from volcanic tuff or ash, and it is usually the mineral montmorillonite but less often beidellite." Investigations have been made over the country, and it has been found that most bentonites either have a minimum of around 70 percent montmorillonite present, or very little. R. B. Ladoo, in Bureau of Mines Report of Investigations No. 2289 states: "The name bentonite has been applied to a group or series of clay-like minerals characterized by an alkaline oxide and alkaline earth content of 5-10 percent, fine grain size, high absorptive powers, and usually very strong colloidal properties."

There is some evidence that the replaceable alkaline earth ions are present to a greater extent than in ordinary shales.

Heaving shales vary greatly in their reaction with water. Some absorb water and become quite plastic. Others crumble and disintegrate completely, while others manifest no visible effect.

An essential difference between a shale under plastic flow and one which swelled due to hydration has been noted. As the plastic flow continued, its fluidity and rate of flow became progressively greater. Plastic flow may be more important in very deep than in shallower wells.

Physically, heaving shale has been classified as: brittle ("buckshot"), compact, or "sticky." The brittle shale is said to contain only small quantities of bentonite, whereas the "sticky" variety supposedly contains a large amount, which promotes swelling upon hydration with water. The compact type is reported as being the most bentonitic and giving the most trouble in drilling wells.

Samples recovered in a Louisiana field showed the heaving shale to be characteristically brownish, shaded with green or gray. It was also "sticky" and had the appearance of "cavings," differing from the brittle, green "ringtail" shales of the Miocene. The calcite marking the top of the heaving shale served as a marker in drilling other wells in the area.

The Yegua formation seems to be the lowest in which heaving shale has been encountered. However, this does not give assurance

Chemicals were generously used in drilling mud to combat heaving shale in the Goose Creek field, as shown by this picture of an elaborate installation of six years ago. The effort was unsuccessful.

that non-heaving conditions will be encountered with deeper drilling down-dip.

Bowling and Wendler[3] have described the Catahoula as follows: "The Catahoula consists of tuffs, green hackly fractured clays, local sand lenses and ash beds. The ash beds are interspersed through the section and are traceable as horizons, but not as persistent beds. The lower ash bed has the general appearance of ashy indurated sandy clay . . . Glasses are also found in the formation . . . In this particular formation the sample consists of pure glass, partially and almost totally devitrified fragments, and glass microlites imbedded in a crystalline ground mass, probably consisting of disintegrated organic material . . ."

According to E. W. Brucks,[4] "The Lower Catahoula formation is of shallow-water marine origin, is even more bentonitic than the overlying beds and contains considerable amounts of volcanic ash . . . This bentonitic character of all the shales and the occurrence of volcanic ash suggests that these beds . . . belong to a period of apparently uninterrupted volcanic activity."

Buck and Michaux[5] described the Yegua, in some cases, to be a chocolate brown, laminated, brittle shale, containing some interspersed fragments . . . The Whitsett[6] is described as "being of beds of greenish gray and yellow waxy or carbonaceous clays and sandy clays with some of the chocolate color interbedded with yellow, gray, or pink sands . . . Beds of volcanic ash occur . . . The Whitsett varies in lithologic character across the state, and can be divided on the surface in lithologic as well as paleontologic zones . . . The clays of the Whitsett are marine."

Ellisor[7] states that "the McElroy . . . is composed of dark blue-to-brown clays . . . light chocolate-brown plastic clays with thin seams of sulfur-yellow stained sands; bluish gray marly, glauconitic clays, which weather yellow; fossiliferous sands, lignitic, sandy, brown shales, and beds of volcanic ash and glass."

The above serves to point out that in most of the areas known to be troublesome there exist conditions conducive to heaving. The definite knowledge of what can happen to disintegrated volcanic material when it is placed in water gives an indication of how aggravated the conditions in the hole might become.

Causes of Heaving Shale

Inclination of Strata

Steep dips accompanying structures such as piercement-type domes are conducive to slide or flow of shales, regardless of type. A certain "angle of repose" of the shale beds, placed at 35 to 45 degrees, has been suggested as a critical condition for sloughing of shale into the bore hole. The situation is made more acute where sand members are absent in down-dip facies.

Internal Fractures and Stresses

Incompetence of the beds caused by crumbling of the shale by rising salt domes, or faulting, has doubtless facilitated heaving shale trouble. Pressures of greater magnitude than the usual hydrostatic heads suggest that the formations have been placed under great tensional and torsional stresses, which are relieved by strain when the formations are disturbed by the drill. The small pea size of the conchoidal, granular shale found suggests the crumpling effect of unusual earth stresses.

Plastic Flow

The almost waxy consistency of the other shales strengthens the theory of plastic flow. The explanation is given that shale under compression due to the weight of the overburden and the added effects of instrusions is stressed beyond its yield point. When penetrated, the shale flows plastically into the hole. The theory is more likely to apply to conditions in deep than in shallow wells.

Hydration and Peptization

Shales having a high bentonitic content are known to swell upon the absorption of water from poorly conditioned drilling fluids. The shale swells within itself, giving rise to unusual pressures and consequent heaving into the hole.

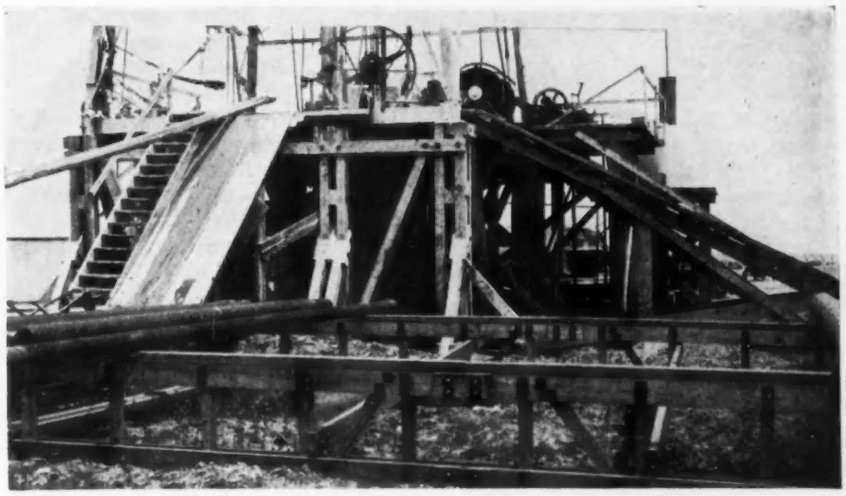
From studies in sedimentation, it can be inferred that what is taking place now in our shallow marine waters, probably happened in an identical manner when the sediments were first laid down.

Let it be assumed that these formations are at the surface. The sands will be found on the shore line, and a little further out will be found the muds and lime. These muds were carried out in suspension by various currents with differential settling taking place, as the particles moved out. Possibly the particles were held in suspension by charges similar to those found on bentonite particles. On arriving a certain distance away from the shore, the particles were partially coagulated by dissolved salts in the sea waters. On agglomeration, these particles settled to the bottom. On emergence, the water was either pressed out of the sediments or partially vaporized. In any event a certain amount of salts was adsorbed to the particles. Following burial and subjection to earth movements, the shales were converted to their present state. It is reasonable to believe, that on penetration of these shales the water forces its way between the particles, allowing adsorbed salts to go into solution. The result probably is not a suspended particle, but one which tends to force itself away from the others around it, and in so doing, adsorbs a thin water layer around each particle. At a point of instability the shales collapse into the drilling fluid. If the drilling fluid is moving at a high enough velocity, these will be removed from the region around the bit. If not, the shales will accumulate, resulting in a stuck drill pipe. Once entering the fluid system, the shales are probably comminuted further, adding an increased number of colloidal particles to the system. This explains the increase in viscosity when a shale formation is penetrated with improper mud. It is also possible that, in addition to the water penetrating the formation between the particles, that some of the chemical in the water increases the charge on the particles, causing them to further repel one another.

Structural relief results in a water line below the oil-gas accumulations and promotes possible desiccation of the sediments. On the other hand, brittle shale containing only small quantities of bentonite may break down rapidly in contact with untreated mud of large free water content and lead to the development of a cavity in the shale. The large cavities may leave unsupported the more resistant, non-heaving shale above the washed out shale. This unsupported shale may then slough into the hole, sticking the drill pipe and causing other serious damage.

Gas

Thermometric measurements across a shale section have shown variations over short distances caused by gas escaping from numerous minute beds in the shales. This situation has led to the hypothesis that the expansion of the



This elevated derrick floor near Freeport, Texas, was the forerunner of cellarless locations along the Gulf Coast. Heaving shale was the chief problem in this area.

gas within the pores and crevices of the formation has broken down the shale as it flowed into the hole. It has also been suggested that gas is adsorbed in the shale and is released when the shale becomes wet. Gas carrying shale has been found to be difficult to combat, since it breaks down rapidly, leaving little time for a protective mud wall to form around the hole. Shales carrying thin layers of gas and sand constitute another type of hazard offering considerable difficulties. Expansion of the gas and absorption of gas by the drilling mud lowers the density of the latter to a point where hydrostatic pressure exerted upon the formation is insufficient to prevent heaving.

Exterior Influences and Negligence

Insofar as drilling operations are concerned, the creation of too large a pressure differential between the formation and the hole may encourage heaving. Unusual pressure differentials may be caused by low density of the fluid column. Gas cutting, over dilution with water, or absence of sufficient weighting material, may result in subnormal densities for the drilling fluid. The operations of spudding, or coming out of the hole with a "balled-up" bit (swabbing action), may also cause excessive differences of pressure.

In one case cited, the mud cake on the wall of the hole was thought to have built up to such thickness that no clearance existed between it and the enlarged sections of the drilling string. The movements of such enlarged sections were thought to have scraped off part of the mud cake to form a tough gummy mass which plugged the annular space, thus gripping the drill pipe and making it difficult to re-establish mud returns.

A progressive reduction in hole diameter increases operating hazards by reducing the possibility of setting a protective string of casing part way through the shale. It also reduces the annular space clearance between the walls of the hole and the tools. This, in turn, aggravates the theoretical condition described above. In addition it is possible that the shales when drilled do not have sufficient mechanical strength to be self-supporting and that the pressure differential present is sufficient to cause flow into the hole.

It has already been noted that cavities are formed in brittle shales by solution processes which promote sloughs from the unsupported overlying shale. Such a process may accelerate so rapidly that the pumps will be unable to handle the material. This may result in excessive deposition on drill collar and tool joints with consequent "shut-off" circulation and stuck drill pipe.

Other suggested causes of heaving are: poor mud qualities, velocity of mud below a critical minimum, discontinuance of circulation, too rapid a drilling rate, insufficient and inefficient walling of the hole.

Miscellaneous

Some variations in causes and additional factors in heaving shale are:

1. The softer parts of shales which are composed of layers of different hardness are washed out, leaving the harder parts as overhanging ledges to fall in.

2. Slaty shales in which drilling mud lubricates between the cleavage planes which promotes sliding into the hole.

3. The cavities formed present difficulties since the mud velocity is lowered at such points and the danger of bridging when circulation is stopped is thereby enhanced.

4. The roof of a cavity may eventually cave with a force sufficient to shear off the drill pipe.

Combatting Heaving Shale

The present discussion will include a review of the methods reported for combatting heaving shale, which may serve as a starting point for much future investigation and research.

General

As a general consideration, the best proportions between hole-diameter and drill pipe should be determined and maintained. Danger zones should be recognized in advance. For instance, in one field it was considered best practice to keep a close watch for calcite crystals, checking with paleontology, and to bottom the hole immediately upon the establishment of the presence of calcite, and/or "Vicksburg."

Mechanical and Operational Methods

Mechanical methods for keeping the water from muds off the shale have not been developed. It does not seem likely that any practical equipment will be developed to accomplish this purpose. On the other hand, the mechanical restraint of swelling shale seems impractical.

The maintenance of rotation of drill pipe except when changing bits, coring, or adding drill stem has been emphasized. Such a procedure was assured by having all

equipment duplicated and of the most substantial type. All possible precautions were taken to prevent a shutdown.

Reduced pulling of drill pipe has been accomplished by the use of wire-line, collapsible-type, drilling bits, and flush-joint stream-lined casing instead of drill pipe. "Swabbing action" has been prevented by circulating drill pipe out of the hole, stand-by-stand, and by continuous circulation as the pipe was pulled from the hole by the use of special continuous-circulation tool joints. High mud-circulation rates in turn may facilitate high drilling speeds if necessary. The circulation action, however, should be such as to not seriously disturb the disintegrating strata through sharp pressure differentials where troublesome beds are encountered. Some report that the use of special tool joints has been abandoned since mud characteristics have been improved.

A number of so-called "heaves" were remedied by alternately pulling and slacking off a few points on the weight indicator while pressure was being maintained. Other heaves may have been so bad that the drill pipe could be rotated but not pulled from the hole. The remedy which was only partially successful, has been to break the bridge by reversing circulation and constant movement of the drill pipe.

Several pressure-drilling methods have been tried and some were partially successful. However, as soon as the pressure was relieved the shale gave trouble. It was especially difficult to maintain a constant back pressure on mud returns at the well head. However, recent information suggests that this difficulty of maintaining constant back pressure has been overcome.

Drilling Muds

Mud weight appears to be an important physical property of drilling fluids up to a certain critical value, beyond which, other properties may become of greater significance. Generally speaking, high weight muds provide a high hydrostatic head which may oppose shear of the shale. They also may assist in controlling high gas pressures. However, it has been noted that most of the mud types have at some time been pumped into the formation with loss of returns when pump pressures exceeded critical values. It appears, therefore, that the solution of the problem of lost returns will be necessary before muds of extremely high density can be used successfully. If the high-density mud appears desirable, it should have a comparatively low viscosity and low gel strength to preclude the possibility of a swabbing action while the drill pipe is being pulled.

Fundamentally, the mud used to combat heaving shale should have the following properties:

1. Inert in relation to its effect on the shale and consequent "heaving."

2. Capacity to build thin, impervious walls rapidly, in order to seal off the formations from penetrating fluids; in other words, the filtration values of the mud sheath should be low. In some cases special emphasis may be laid on extra mechanical strength.

3. Satisfactory viscosity, gel-strength, and gel-rate.

4. Capacity to reduce the tendency of ion exchange between the mud and the formation.

Research Program

Since the attack on the heaving-shale problem by mechanical means was principally a matter of field investigation, it was concluded that a research program should center around the physical and chemical properties of heaving shales, and the effect of added chemicals on such properties. Since drilling fluids and their added chemicals assume a close relationship to heaving shales as noted previously, the nature of the investigation was established more clearly.

Accordingly, the research program on the heaving-shale problem has been under way for the past year at The University of Texas. It was realized that a fundamental attack should be made first on substances of known compositions, such as Wyoming bentonite. It appeared necessary to establish a procedure for the analysis of chemical and physical properties of the samples. In addition it was necessary that the procedure include the effect of added chemicals on the native properties of the shale. This procedure will be applied to more complex well samples in future investigations. The difficulty of obtaining uncontaminated samples of heaving shale from wells makes it doubly important to examine the better known substances first.

Inasmuch as bentonites constitute an aggregate of particles, it was logical to assume that the size and number of particles in a given mass would give a definite indication of the role that surface forces assumed in the control of heaving shale. The various fractions obtained by centrifugal methods have been tested for viscosity, gel strength and structural stability.

Analysis of the various ions in the sample was accomplished by electro-dialysis. In one sample, it was found that a considerable amount of sodium, and slight amounts of potassium, were present. Knowing the amount and kind of ions adsorbed on the bentonite (or shale) particles, it was feasible to propose counter-ions for inclusion in the mud fluid for reduction of peptizing effect on the formation and the resulting hydration of the particles. However, there has been some doubt that shales heaved solely by reason of their bentonitic content. It was thought particles above the colloidal range may have had some influence.

A considerable amount of fundamental data has been collected with respect to the coagulating effect of various chemicals on bentonite systems. A full description of results obtained is in the course of preparation for publication at this time. In the meantime, suggestions from the field will be appreciated. The greatest help that can be given is to furnish samples thought susceptible to "heaving" from drilling wells in the Gulf Coast.

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* Personal communication.

References

[1] Ross, C. S., "Minerals of Bentonite and Related Clays and Their Physical Properties," A.A.P.G. Vol. 12, 1926, p. 65.

[2] . . . Amer. Ceram. Soc. Journal, Vol. 9 (1926), p. 79.

[3] Bowling, L. and Wendler, A. P., "Detailed Study of Some Beds, Commonly Known as Catahoula Formation in Fayette County, Texas, With Particular Reference to Their Age"; in "Gulf Coast Oil Fields," page 544. The American Association of Petroleum Geologists, Tulsa, Oklahoma, 1936.

[4] Brucks, E. W., "Buckeye Field, Matagorda County, Texas," in "Gulf Coast Oil Fields," pages 751-752, The American Association of Petroleum Geologists, Tulsa, Oklahoma, 1936.

[5] Buck, E. O. and Michaux, F. W., Jr., "Conroe Oil Field, Montgomery County, Texas," in "Gulf Coast Oil Fields," page 798, The American Association of Petroleum Geologists, Tulsa, Oklahoma, 1936.

[6] Ellisor, Alva C., "Jackson Group of Formations in Texas with Notes on Frio and Vicksburg," in "Gulf Coast Oil Fields," page 487, The American Association of Petroleum Geologists, Tulsa, Oklahoma, 1936.

[7] Ibid., page 480.

Field Tests of Gas Show Prospects For *Cycling*

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THE recovery of liquid from natural gas is not a new process, as low pressure adsorption and compression gasoline plants are familiar sights in most of the present-day oil fields. In the familiar natural-gasoline-recovery process the well stream is stripped of its liquid in the separator and the gas is taken into the plant at relatively low pressures. Only dry gas enters a typical natural gasoline plant for processing.

The testing of this dry gas for gasoline content is a standardized procedure. The results are ordinarily accurate enough to determine the desirability of actually constructing a plant.

The high-pressure wet gas, condensate or distillate field usually offers a rich yield in condensable liquids, but the extraction process is naturally different. In a natural gasoline plant the extraction process is concerned only with liquid recovery from a dry gas, while in the recycling plant where liquid and gas has to be dealt with, separation, absorption and compression of the dry gas enters into the problem. Naturally, the more liquid recovered by separation the less the absorption costs will be, but this must be in balance with the cost of compressing the processed gas. It is usually found that these plants operate at a pressure and temperature condition close to the optimum separation yield point.

The testing of wet gas and its associated free liquid for liquid

THIS discussion describes the proceedure and results of field testing of gas to determine the feasibility, both from an operating and economical standpoint, of erecting a cycling plant. The original paper entitled: "Testing of Gas to Determine the Feasibility of a Recycling Plant" was presented before the Spring Meeting of the Southwestern District API Division of Production, at Shreveport, February 27-28, 1941. The statements and opinions expressed are those of the author and should not be construed as an official action or opinion of the Institute or this publication.

Definitions of Terms

DEFINITIONS of some of the terms employed by the industry in discussing some of these problems are given to classify the statements in this paper. These terms have been commonly used since the industry has been processing gas by cycling.

Dry Gas. A hydrocarbon mixture where all of the constituents are in a gaseous state at existing surface conditions.

Wet Gas. A mixture of hydrocarbons where some of the constituents are liquid at existing conditions.

Condensate. The liquid portion of wet gas, commonly used in reference to any liquid that can be obtained from the gas by simple separation.

Natural Gasoline. The liquid obtained from dry gas by absorption, compression or a combination of adsorption and compression.

Charcoal Test. The adsorption of natural gasoline from dry gas by the use of a charcoal-filled tube. This test is standardized by the Natural Gasoline Manufacturing Association.

Podbielniak Analysis. A chemical analysis of a gas or liquid.

Retrograde Behavior of Condensate. The variation in gas-liquid ratio caused by changing conditions of pressure and temperature.

Optimum Separation Point. The pressure and temperature conditions where the maximum point of condensation occurs in the separators under field operation.

Continuous Sampling. The diverting of a representative portion of the flow stream from the well through a testing apparatus where separation of gas and liquid may be accomplished under controlled conditions of pressure and temperature.

Batch Sampling. The taking of separate samples of gas and liquid from a separator under pressure, and recombining such samples in a laboratory in the same ratio of gas to liquid as existed in the separator that the samples were taken from, at the same pressure and temperature as existed at the time of the test.

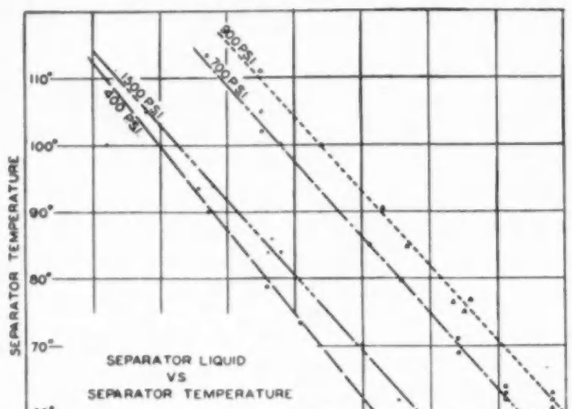

FIGURE 1

Separator Liquid vs. Separator Temperature shows the temperature effect on condensation at various pressure points.

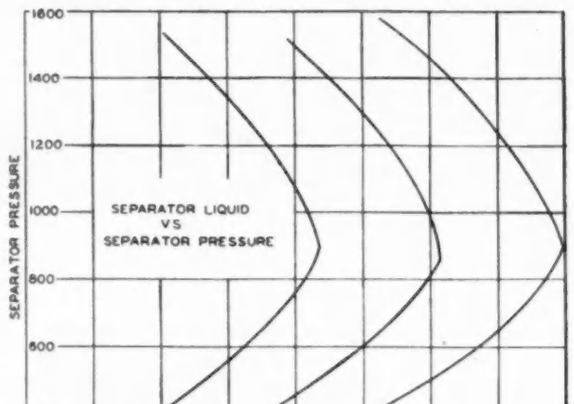

FIGURE 2

Separator Liquid vs. Separator Pressure is the cross plot of Figure 1 and shows the pressure effect at a constant temperature.

content is not a simple process like testing dry gas.

First, the product from the well is two phase; that is, a mixture of gas and liquid instead of true gas. Second, the amount of liquid or the gas/liquid ratio varies throughout the flow system, depending upon pressure and temperature.

A study of the gas/liquid ratio reveals that in most instances all of the product is in a gaseous or single-phase state under reservoir pressure and temperature, and that condensation occurs in varying amounts as pressure is released and temperature is reduced. Liquid condensation increases until the optimum conditions are reached, then the process reverses and the vaporization of liquid starts. Thus, for any wet gas there is a definite pressure at a fixed temperature where a maximum condensation occurs. This point can only be determined by actual testing.

If the total recoverable liquid content of the gas is to be found, tests should be made at the optimum liquid yield point in the separator to reduce possible error. The reason is obvious because at this point maximum liquid condensation has occurred in the separator, and the tail gas contains a minimum of recoverable liquid. Liquid and gas volumes can be measured more accurately in a separator than by charcoal adsorption from a gas, thus the overall measurement is reduced to a minimum of possible error.

There are two main types of extraction processes operating under the common name of recycling plant. These consist of simple separation plants and high-pressure adsorption plants. The finished product from these plants varies from a high-gravity liquid mixture called condensate or distillate to

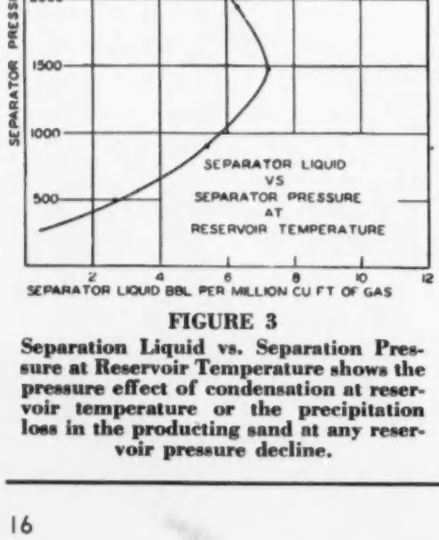

FIGURE 3

Separation Liquid vs. Separation Pressure at Reservoir Temperature shows the pressure effect of condensation at reservoir temperature or the precipitation loss in the producting sand at any reservoir pressure decline.

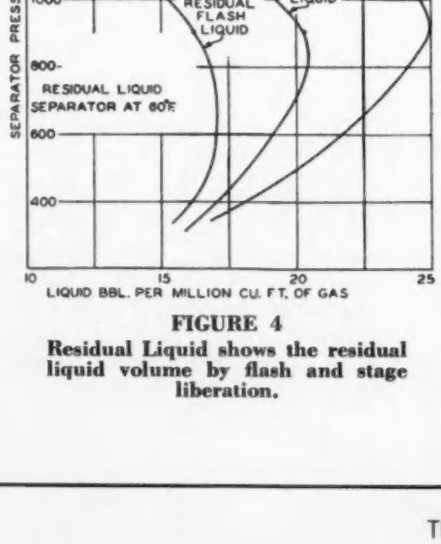

FIGURE 4

Residual Liquid shows the residual liquid volume by flash and stage liberation.

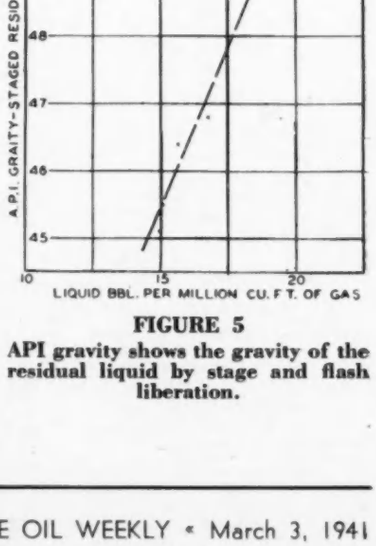

FIGURE 5

API gravity shows the gravity of the residual liquid by stage and flash liberation.

the finished products of gasoline, naphtha and gas oil.

The type plant depends upon the economics of extraction and the nature and composition of the gas.

Field testing has now advanced to a point where, in working in conjunction with the laboratory, all of the economics of a recycling plant can be determined.

These tests can be taken somewhat as follows:

First. The productivity index of the well or wells should be determined. This test will determine the number of wells necessary to supply a sufficient volume of gas for recycling operations.

Second. The total liquid content of the gas must be known. This fact enables the operator to decide if the liquid yield is sufficient, for the volume of gas processed, to offset the expense of constructing and operating a plant.

Third. The chemical composition of the flow stream must be accurately determined for a basis for plant design.

Fourth. Complete liquid, pressure and temperature curves must be plotted on the mixture. These data balance the economy of plant operating pressure with compression costs to give the greatest liquid yield at the lowest possible operating expense.

Field Testing

The potential test can be taken by the usual "back-pressure method," by producing the well through various size orifices and measuring the gas and corresponding pressure drops. Texas conservation regulations permit a daily production of 25 percent of the open flow potential of the well.

The usual physical gas analysis tests are now conducted by the continuous sampling method. This method of testing offers many advantages over other methods formerly in use.

First: It is cheaper.

Second: It is faster.

Third: All calculations can be made in the field and operator errors corrected before the apparatus is moved.

Fourth: The tests can be made without disturbing the flow of the well.

An analysis of the field data available by the use of these tests is as follows: The total liquid content of the gas can be determined by a measurement of the liquid and the gas by separation at a fixed temperature and pressure, and adding the separator liquid to the liquid obtained by charcoal adsorption from the tail gas.

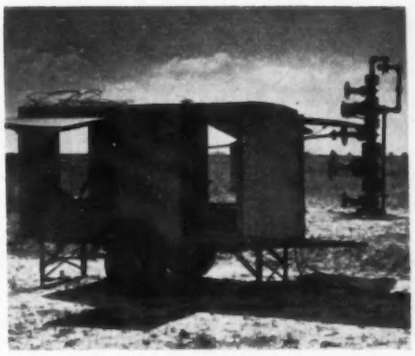

FIGURE 6
Portable Continuous Sampling Apparatus

The retrograde behavior of the liquid and the optimum liquid yield conditions can be found by making numerous separator tests at various conditions of pressure and temperature.

The liquid accumulating in the separator under any condition of pressure and temperature may be brought to atmospheric pressure either by stage or differential liberation of the dissolved gases. The fraction of the separator liquid that remains as a stable liquid under atmospheric pressure depends upon the method of liberating the dissolved gas. These factors may be obtained during field testing; such results are very near those obtained in a simple separation plant. Liquid content of the gas liberated from the separator liquid as it is reduced to atmospheric pressure may be determined in the field by charcoal adsorption, and the volume of dissolved gas per barrel of liquid determined at the same time.

By measuring the API gravity of the residual liquid obtained from the various test conditions of separation and release of dissolved gas, gravity of actual separation plant product is determined.

Bomb samples of the liquid and gas can be taken at any convenient pressure and temperature during the test for chemical analysis.

The accompanying charts graphically show some of the physical properties of wet gas and explain the type data obtainable from field testing. These graphs [Figures 1, 2, 3, 4 and 5] are from a typical Southwest Texas wet gas well.

Conclusions

Field testing has proven to be an economical and accurate method of determining whether the liquid content of wet gas is sufficient to justify the building of a recycling plant.

It must be remembered that, if the liquid content of the gas is favorable, there are many additional problems to be considered before the construction of a plant is undertaken. These other problems are concerned with a sufficient reserve of gas, the number of wells to be drilled, the location of the producing and input wells and producing-sand conditions. It can be better stated that the liquid content of the gas is a very vital part of a problem to be solved but only one of many conditions that must be found favorable before a plant can be built.

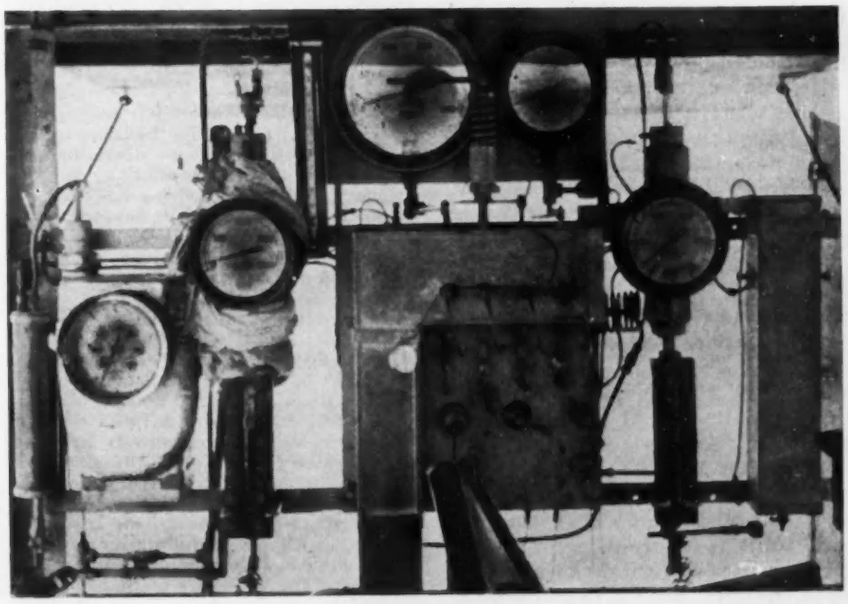

FIGURE 7
Instrument Panel

Future Role of Residual Fuel Oil

By W. B. CASE

THE products derived from petroleum are many and their uses are varied. To list all of them would be a considerable undertaking, particularly as the list grows longer day by day. For several years past, however, the principal products have been gasoline for use in internal combustion motors, kerosene for domestic heating, and, to a considerably lesser extent than heretofore, for lighting; distillate fuel oil used principally for heating and as diesel fuel; lubricants to oil the wheels of industry; residual fuel oil used as a fuel in heavy industry—the railroads, shipping, the oil industry itself, etc., and the solid products wax, asphalt and coke. Strangely enough over the years the supply of these products has been kept in reasonable balance with the demand. At times disequilibrium has occurred and voluntary effort on the part of the industry has been required to restore a balanced condition, but, on the whole, prices operating in a free economy seem to have kept the relative outputs reasonably well balanced.

In discussions of the economics of this amazing industry over the last 30 years, gasoline, as the major product, has received the greatest consideration. In more recent years the widespread use of distillate fuel oil for domestic heating has forced upon the industry the necessity of supplying two "major products" from the same crude. These twins which are taken simultaneously out of the same crude, have proved at times a troublesome pair, as the peak consumption of each occurs during the period of the lowest consumption of the other. However, by judiciously accumulating one while the other is being consumed, the two demands—entirely unrelated one to the other—have been met.

Over the last 40 years at least residual fuel oil has accounted for a substantial percentage of the total output of refined products. Originally produced as an unwanted by-product dumped on the market and destined to be booted around down through the years, it nevertheless has had an important effect on the general economy of the industry. It is of great importance today because of the possibility of a substantial increase in consumption of the product by the Navy and by industries engaged in the manufacture of defense materials where residual fuel oil has a decided advantage over other forms of fuel. Consequently, it is in order to give some thought to what might happen should such an increase develop.

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RESIDUAL fuel oil is of special importance now because of the possibility of a substantial increase in consumption by the navy and by industries engaged in manufacture of defense materials where this product has a decided advantage over other forms of fuel. In the face of an indicated continuous decline in the yield of this product, the author points out the several ways by which gains in demand might be met and concludes that the flexibility of the market and the free functioning of price will assure an adequate supply at a reasonable price to "inflexible" consumers. The discussion was presented before the New York Meeting of the American Institute of Mining and Metallurgical Engineers, February, 1941 under title: "The Role of Residual Fuel Oil in the Petroleum Industry."

The question has both near-term and long-term aspects. As to the latter it is reasonable to assume that the yield of residual fuel oil from crude oil will continue to decline as it has over the last 25 years so that regardless of increases that might be expected in the amount of crude refined to meet the major products, no great increase can be expected in the amount of residual fuel oil available. We might inquire, therefore, as to just what the industry's attitude will be toward the additional demand.

Stocks of the product on the East Coast and Gulf Coast at December 31 were adequate and actually about 5,500,000 barrels higher than a year ago. In other refining districts east of California they were about 1,500,000 barrels less than a year ago. In total, east of California, there was an increase in stocks of 4,000,000 barrels. As the domestic demand east of California during 1940 was about 253,000,000 barrels, these additional stocks would supply less than a 2 percent increase in demand. Among the other ways of meeting the increase in demand might be listed the following:

1. Increasing the output of the product by refining more crude oil.
2. Increasing the yield of the product from crude oil.
3. Varying the relative production of high gravity and low gravity crudes.
4. Moving it from California where a surplus exists to the East Coast.
5. Importing additional supplies.
6. Restricting the use of fuel oil to only those users for which other fuels cannot be substituted.

Before examining any of these possibilities, it is worthwhile to see how the increase in demand has been met in the past. In looking over the history of the product, the years up to about 1900 can be ignored. During that time most of the crude oil produced in the United States came from the Appalachian region and was refined al-

most entirely into gasoline, which was not wanted, kerosene, lubricants and wax. From 1900 to date, the history falls rather naturally into three periods or time divisions, the boundaries of which have not been sharp or distinct. The first period comprises the years 1900 to approximately 1915, during which the production from fields in the southwest and California increased rapidly. This first period closes with the acceptance of the cracking process of refining. The next period is that in which more and more fuel oil was used in cracking stills and ends some time in the 30's, when practically all fuel oil was cracked to some extent. The third period extends up to the present.

Beginning about the turn of the century when mechanical industrialization of the nation was going forward rapidly, the increasing consumption of gasoline and lubricants could be met only by refining additional quantities of crude oil. The discovery and development of the fields in Southwestern States and in California after 1900 resulted in the manufacture of a large supply of residual fuel oil for, with the refining processes existing prior to about 1915, the greater part of the residuum left after distilling off the gasoline and kerosene by straight-run methods was sold as fuel oil. To the extent for which there was a market, some of the residuum was further refined into lubricants, wax, road oil and asphalt.

In this first phase of residual fuel oil history, when the demand for gasoline was growing by leaps and bounds and could be met only by refining additional amounts of crude, the fuel oil had to find a market and mechanical industries which were being created were willing to buy it but only on a strictly heat-content basis. The fuel oil, consequently, had to be sold in competition with coal with little, if any, consideration being given to its advantages as a liquid fuel. The exception to this was the widespread use of fuel oil by railroads in the Southwest and in California where it would have been prohibitively costly to drop supplies of coal along the route of the railways particularly those traversing vast stretches of unsettled land. Along with this use of the product by the railroads other industries soon recognized the advantages of the liquid fuel and beginning about 1910 Mexican oil was imported into the United States for use principally as fuel. This import movement increased year by year on into the second period of the history.

The second phase in the history of the product began with the acceptance of cracking as a refining method some time about 1915. After the potentialities of residuum as a source of gasoline had been recognized there was an ever-increasing use of residual fuel oil as a charging stock to cracking plants and the end of the second period occurred some time in the 30's when straight-run residual fuel oil practically ceased to be marketed east of California. During this second period the increase in the demand for gasoline continued to require greater and greater amounts of crude oil and as mentioned, imports from Mexico continued to increase. During the year 1921 imports into the United States were equal to more than 26 percent of the domestic production. Late in 1922 the supply was further augmented substantially by shipments of California crude through the Panama Canal following the discovery of the prolific fields in the Los Angeles Basin, the oil from which contains a large percentage of residual fuel. At about the same time the great Smackover field was discovered and much of its low-gravity production was burned as fuel oil.

It might be well to note at this point that except for the years 1922 to 1926, California supplies of

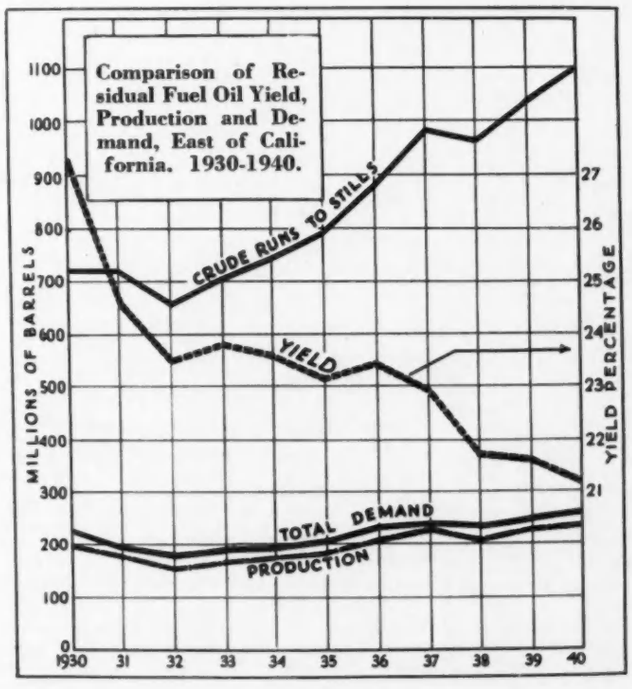

FIGURE 1

Crude Oil Runs to Stills, Residual Fuel Oil Yield, Refinery Output of Residual Fuel Oil and Total Demand for Residual Fuel Oil—All East of California for Years 1930 to 1940 Inclusive.

	Runs To Stills 1000 Barrels	Residual Fuel Oil Yield Percent	Refinery Output of Residual Fuel Oil 1000 Barrels	Total Demand For Residual Fuel Oil—Domestic & Export 1000 Barrels
1930	722,619	27.3	197,312	225,797
1931	721,600	24.6	177,450	199,009
1932	655,260	23.5	154,251	179,569
1933	703,996	23.8	167,618	188,846
1934	739,301	23.6	174,381	189,917
1935	787,939	23.1	181,607	201,473
1936	878,827	23.4	205,607	228,480
1937	980,295	22.9	224,364	237,870
1938	964,681	21.7	208,849	230,624
1939	1,039,186	21.6	224,962	248,750
1940	1,093,260	21.2	232,525	257,534

Source: U. S. Bureau of Mines Reports.

crude oil and residual fuel oil have had little effect on the industry east of California and in any discussion of residual fuel oil the two areas, namely, Pacific Coast states and east of California, might better be thought of as separate and distinct provinces. There has been some eastward movement of California residual fuel oil in recent years but in spite of the tremendous surplus of the product in California, shipments in each of the last six years have amounted to less than one million barrels a year. Of vastly more importance has been the effect of the world wide market on both of these provinces. In California, today, the stocks of residual fuel oil and non-gasoline-bearing crude oil suitable for use as fuel oil, amount to more than 70 million barrels and there is no problem whatever in meeting any conceivable increase in demand. The remainder of the discussion, therefore, will be confined to that part of the United States east of California.

Although separate figures for distillate and residual fuel oil are not available prior to 1930, the combined statistics prior to that date indicate that the demand for residual fuel oil increased steadily up to the year 1929 and this in face of a declining percentage yield from crude. During the depression years 1930 to 1933 the trend of demand was downward but with the recovery it turned upward again in 1934 to 1937. Nineteen hundred and thirty-eight again saw a reversal but increases in 1939 and 1940 brought the domestic demand for the product to an all-time high of approximately 252,700,000 barrels east of California (335,600,000 barrels for the United States). The increase in demand from 1930 to 1940 like the increase prior to 1930 has been accompanied by a constantly declining percentage yield from crude.

Figure 1 and Table 1 show the relationship between the total demand, domestic and export, for residual fuel oil east of California and the yield from crude. Also shown are the runs to stills and the refinery production of the product.

Figure 2 and Table 2 show the yields of the principal products obtained from crude oil during the years 1916 to 1940 inclusive—the second and third periods in the product's history. Yields of all fuel oils — distillate and residual — decreased from 47.6 percent in 1918 to 35.7 percent in 1930. The reduction in the yield of residual fuel oil was more pronounced than is indicated by these figures because of the increase in distillate fuel oil that must have occurred during this period. Although statistics are not available on the output of distillate fuel oil in 1918 it is known that their use was limited and it probably is fair to say that the yield of residual fuel oil decreased from approximately 45 percent in 1918 to the statistically recorded 27.3 percent in 1930. The yield continued to decline to 21.2 percent in 1940—less than half the 1918 percentage yield.

In the third or present-day phase of the product, the use of residual fuel oil can be thought of as being composed of two parts—the one flexible, that is, susceptible of being replaced by substitute fuels; and the other inflexible, that is, not readily susceptible to replacement. Among the inflexible consumers are most of the railroads now using the fuel, to some extent the oil companies themselves and a part of those who use the product for heating. The use of the fuel in ships is, of course, most inflexible but those engaged in international trade can buy elsewhere than in the United States if the price at another port of call is more attractive. The flexible users are the gas and electric power plants and most industries. Figure 3 and Table 3 show the distribution of the use of residual fuel oil. (Figure 3 for the year 1939 east of California only.) For the year 1939 (the last year for which actual figures have been published) the use in ships accounted for over 19 percent of the total consumption. The railroads used 14.7 percent of the total and 14.2 percent was used for heating. Industries, other than railroads, gas and electric power plants used 21

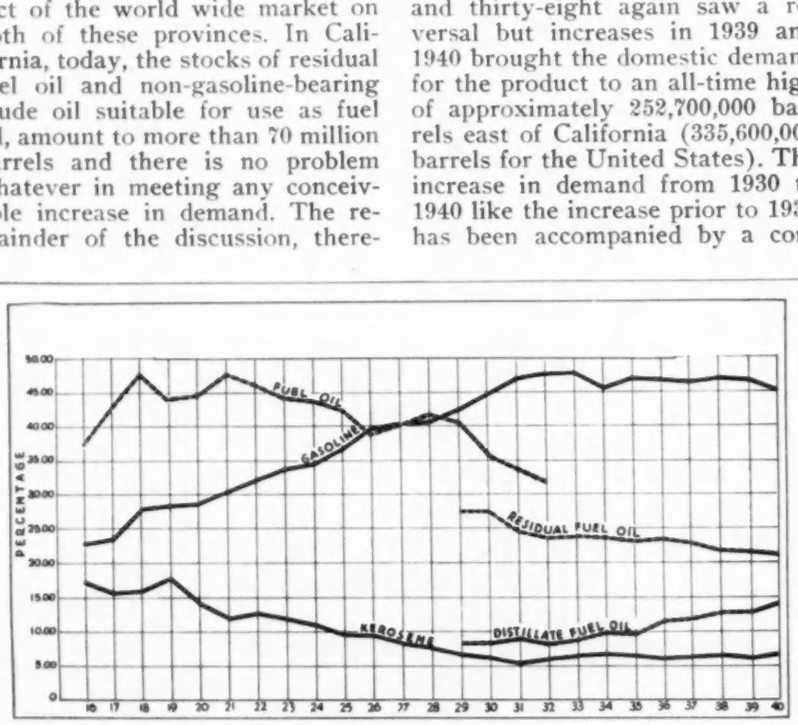

FIGURE 2

Yields of Principal Products from Crude Oil East of California 1916 to 1940

	Gasoline Percent	Kerosene Percent	Dist. F. O. Percent	Res. F. O. Percent	Total F. O. Percent
1916	22.09	17.16	....	....	37.35
1917	23.61	15.61	....	....	42.73
1918	27.92	15.80	....	....	47.59
1919	28.29	17.64	....	....	43.95
1920	28.46	14.08	....	....	44.37
1921	30.28	11.87	....	....	47.47
1922	32.18	12.64	....	....	45.95
1923	33.59	11.78	....	....	44.05
1924	34.52	10.70	....	....	43.64
1925	36.73	9.59	....	....	42.27
1926	39.53	9.45	....	....	38.93
1927	40.13	8.15	....	....	40.04
1928	40.89	7.26	....	....	41.53
1929	42.22	6.38	....	....	40.88
1930	44.15	5.94	8.38	27.31	35.68
1931	46.6	5.3	8.9	24.6	33.5
1932	47.3	5.8	8.1	23.5	31.6
1933	47.4	6.2	8.7	23.8	32.5
1934	45.7	6.5	9.9	23.6	33.5
1935	46.8	6.4	9.81	23.05	32.8
1936	46.3	5.9	11.4	23.4	34.8
1937	46.1	6.1	12.0	22.9	34.9
1938	46.7	6.3	12.7	21.7	34.4
1939	47.2	6.1	12.7	21.6	34.3
1940	45.2	6.5	14.2	21.2	35.4

Source: U. S. Bureau of Mines Report.

percent and the oil industry itself was one of its own good customers and used 15.7 percent of the total. The inflexible use of the fuel would appear, therefore, to include much of the 19.4 percent used by ships, the greater part of the 14.7 percent used by the railroads, some portion, perhaps half of the amount used for heating and the larger proportion of the amount used in the oil industry or roughly about 50 percent of the total. Thus, the flexible use is about equal to the inflexible use.

The inflexible use of the product is related very closely to general industrial conditions. The flexible use is related almost entirely to price and is in fact more sensitive to the effect of price than are any of the other principal petroleum products. Thus, there was a reduction in the use of fuel oil by railroads and ships in 1938 as compared to 1937 paralleling the decline in business activity. The gas and electric power plants, however, used less in 1937 than in 1936 but increased their use in 1938. Their reduced consumption in 1937 was doubtless the result of the high prices which existed in that year and ran counter to trend of industrial production.

The question of proper and improper uses or, as sometimes disguised, superior and inferior uses of residual fuel oil has been raised on many occasions in recent years. It is rather difficult to define a proper or superior use of the product. In the light of present-day conditions, the use of uncracked residuum and of vast quantities of refinable crude oil such as were burned in the years 1900 to 1915, would doubtless be considered improper; but conditions which existed at that time put an entirely different aspect on the practice. The manufacture and sale of cracked residuum today is purely a question of refining economics. A refiner might be equipped to crack his light oils to gasoline and heavy fuel oil or to run to coke but if the final stages of cracking cost more than the value of the products which he recovers, he will sell his residuum as fuel oil.

It is not the present purpose to unearth an old bone of contention as to proper or superior and improper or inferior uses. It seems of much greater importance that about half the demand can be filled by substitute fuels and that this half will switch to other fuels whenever the equivalent heat content can be obtained from them at lower cost. It must also be borne in mind that the price of crude oil acts as a ceiling for the price of residual fuel oil and that crude prices do affect the demand for residual fuel oil.

It has been pointed out that over the years, in spite of the increasing demand for residual fuel oil the industry continuously has reduced the percentage yield from crude oil and has met the mounting demand by other means — imports, shipments from California and the use of low-grade crude oil. The statis-

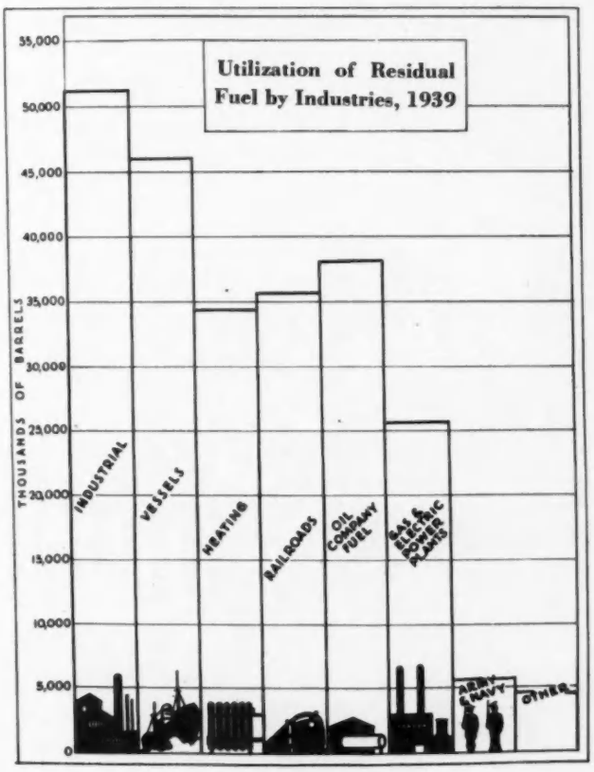

FIGURE 3

Distribution of Use of Residual Fuel Oil

	1936* 1000 Barrels	1937 1000 Barrels	1938 1000 Barrels	1939 1000 Barrels	1939 Percent Total	1940* 1000 Barrels
East of California:						
Heating No. 5 & No. 6	25,031	29,525	31,157	34,502	14.22	40,000
Railroads	35,500	38,605	32,439	35,669	14.70	36,000
Vessels	47,300	52,120	46,230	47,191	19.44	46,000
Gas & Elec. Pow. Plants	21,500	19,914	21,118	25,611	10.55	27,000
Other Industries	55,200	57,640	46,787	51,253	21.12	55,000
Navy, Army & C. G.	2,500	3,177	4,563	5,507	2.27	6,000
Oil Company Fuel	40,900	36,573	36,384	38,190	15.73	38,000
Miscellaneous Uses	2,300	3,784	3,176	3,646	1.50	4,722
Unaccounted for	4,890†	6,543†	1,385	1,143	.47	....
Total	225,341	234,795	223,239	242,712	100.00	252,722
Pacific Coast Territory:						
Heating No. 5 & No. 6	4,367	5,857	4,778	4,599	5.97	4,500
Railroads	24,800	29,224	23,670	25,308	32.85	28,500
Vessels	19,700	19,376	14,948	17,955	23.31	20,000
Gas & Elec. Pow. Plants	2,000	3,607	2,764	2,297	2.98	2,500
Other Industries	10,200	11,467	8,027	9,598	12.46	11,000
Navy, Army & C. G.	6,500	5,615	6,411	5,652	7.34	6,000
Oil Company Fuel	4,100	3,622	4,130	7,833	10.17	8,000
Miscellaneous Uses	4,000	3,127	1,763	1,344	1.74	2,433
Unacct'd for & Diesel Fuel	6,876	8,824	2,103	2,440	3.18	....
Total	82,543	90,719	68,594	77,026	100.00	82,933
United States:						
Heating No. 5 & No. 6	29,398	35,382	35,935	39,101	12.22	44,500
Railroads	60,300	67,829	56,109	60,977	19.07	64,500
Vessels	67,000	71,496	61,178	65,146	20.37	66,000
Gas & Elec. Pow. Plants	23,500	23,521	23,882	27,908	8.73	29,500
Other Industries	65,400	69,107	54,814	60,851	19.03	66,000
Navy, Army & C. G.	9,000	8,792	10,974	11,159	3.49	12,000
Oil Company Fuel	45,000	40,195	40,514	46,023	14.39	46,000
Miscellaneous Uses	6,300	6,911	4,939	4,990	1.56	7,155
Unaccounted for	1,986	2,281	3,488	3,583	1.14	....
Total	307,884	325,514	291,833	319,738	100.00	335,655

Source: Bureau of Mines except as noted:
* Estimates by Author. † Denotes Red Figure.

tics of the industry do not yield any evidence that the industry as a whole has ever sought to increase its output of residual fuel oil by refining additional quantities of crude oil. It is understandable that in isolated instances some refiner having an order for heavy fuel oil for which he would not have the necessary supplies, might have stepped up his runs temporarily knowing that he would have a market for the other products but such a practice has never prevailed throughout the industry. Rather the attitude seems to have been that the industry would supply whatever quantities of heavy fuel it found necessary to make in supplying the markets for gasoline, kerosene and distillate fuels and that any demand for the product beyond that would have to be filled from supplies obtained from other sources which up to the present have always been available. This attitude on the part of the industry coupled with the flexibility of half the demand, the ever present alternative of importing supplementary supplies and the normal functioning of price has operated to keep demand and supply in balance. In other words, demand for residual fuel oil has not functioned in the determination of the required runs of crude to stills nor in the demand for crude oil. From the standpoints of industry economies, social economics and conservation of our petroleum resources it is proper that it should not. So long as runs to stills are regulated to meet the demand for gasoline and distillate fuel oil, with equilibrium between these products maintained by regulating the yields and accumulation of stocks in the "off" season, the respective demands for these essential products for which there is no acceptable substitute can be met from a predetermined quantity of crude oil. But were the industry to attempt to bring into the determination of the required runs to stills such a nebulous factor as that of supplying a by-product to be used in destructive price competition with other fuels, the supply of the essential products would greatly exceed the demand, our valuable reserves of petroleum would be depleted needlessly and chaotic conditions doubtless would result. The oil industry has never done this.

Of the six methods suggested earlier for balancing supply and demand it thus appears that the first two namely (1) increasing the output of residual fuel oil by refining more crude and (2) increasing the yield, are contrary to the progressive principles which the industry has followed over the years.

The third proposal, namely that of varying the production of high-gravity and low-gravity crudes seasonally has many merits. However, the seasonal change in the relative quantities to be produced from the wells can be obviated by storing the low-gravity crude in the summer for use in the winter and vice versa for the high gravity. Insofar as the balance between gasoline and distillate fuel oil is concerned, the industry has solved the problem by seasonal variation in yields and accumulation of adequate stocks. The proposal has found its greatest objection in the inequities that would result in the administration of proration. In any event, inasmuch as the seasonal variation in production is actually unnecessary, it seems reasonable to assume that if a greater year-round demand for these low-gravity crudes did actually exist, it would be reflected in today's proration schedules.

The possibility of moving residual fuel oil from California depends, of course, entirely on tanker rates, the availability of boats and the price to be ralized in the Eastern market. With tanker rates as they are today such a movement is unprofitable as it amounts to nearly two and a half times the cost of bringing supplies from the Gulf Coast or from the refineries in the Caribbean. The cost of moving supplies from these latter refineries to the eastern seaboard for use in ships engaged in foreign trade is not prohibitive even with present tanker rates. Such a movement releases for domestic use an equivalent amount of the fuel; it may be expected that it will continue at a high level.

From what has gone before it seems clear that the sixth proposal namely restricting use need not arise. The flexibility of the market and the free functioning of price will assure an adequate supply.

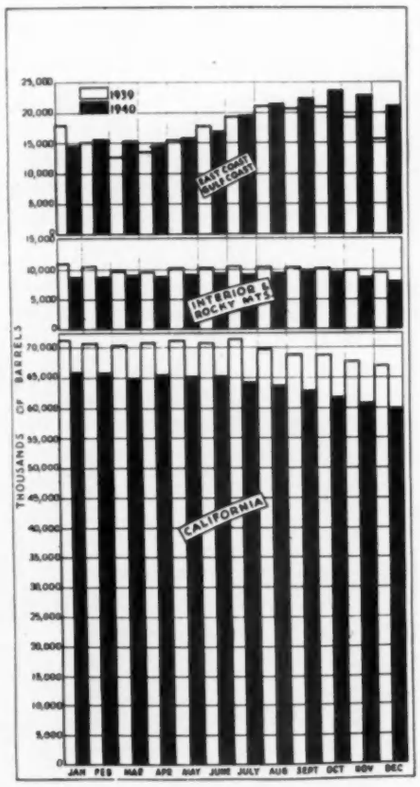

FIGURE 4

Refinery Terminal and in Transit Stocks of Residual Fuel Oil—1939 and 1940

	Jan. 1	Jan. 31	Feb. 28–9	Mar. 31	April 30	May 31	June 30	July 31	Aug. 31	Sept. 30	Oct. 31	Nov. 30	Dec. 31
1939:													
East Coast-Gulf Coast	23,076	17,295	15,076	12,788	13,434	15,513	17,376	19,453	21,239	20,949	21,163	19,261	15,768
Interior & Rocky Mountain	12,266	11,059	10,567	9,826	9,760	10,143	10,187	10,431	10,336	10,272	10,110	9,987	9,629
California	70,755	71,239	70,642	70,480	70,877	71,088	70,842	71,280	69,786	68,842	68,648	67,448	66,893
Total United States	106,097	99,711	96,285	93,094	94,071	96,744	98,405	101,164	101,361	100,063	99,921	96,696	92,290
1940:													
East Coast-Gulf Coast	15,768	14,639	15,489	15,398	14,808	15,801	17,002	19,665	21,475	22,385	23,448	22,916	21,238
Interior & Rocky Mountain	9,629	8,647	8,656	8,998	8,774	8,940	9,037	9,018	9,371	9,732	9,439	8,722	8,174
California	66,893	65,995	65,639	64,955	65,350	65,094	65,109	64,346	63,575	62,830	61,771	60,754	59,892
Total United States	92,290	89,281	89,784	89,351	88,932	89,835	91,148	93,029	94,421	94,947	94,658	92,392	89,304

Source: U. S. Bureau of Mines Reports.

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• When something's gone haywire up above—or below the platform—or around the pump or engine—or there's trouble with an obstinate or battered tool joint . . . when it's a file you need, you want it quick and you want it *good*.

The difference between the cost of just any old file and a tough, fast-biting top-quality file isn't a drop in the bucket compared to the value of a workman's time or the loss that every minute's delay can cost the operator.

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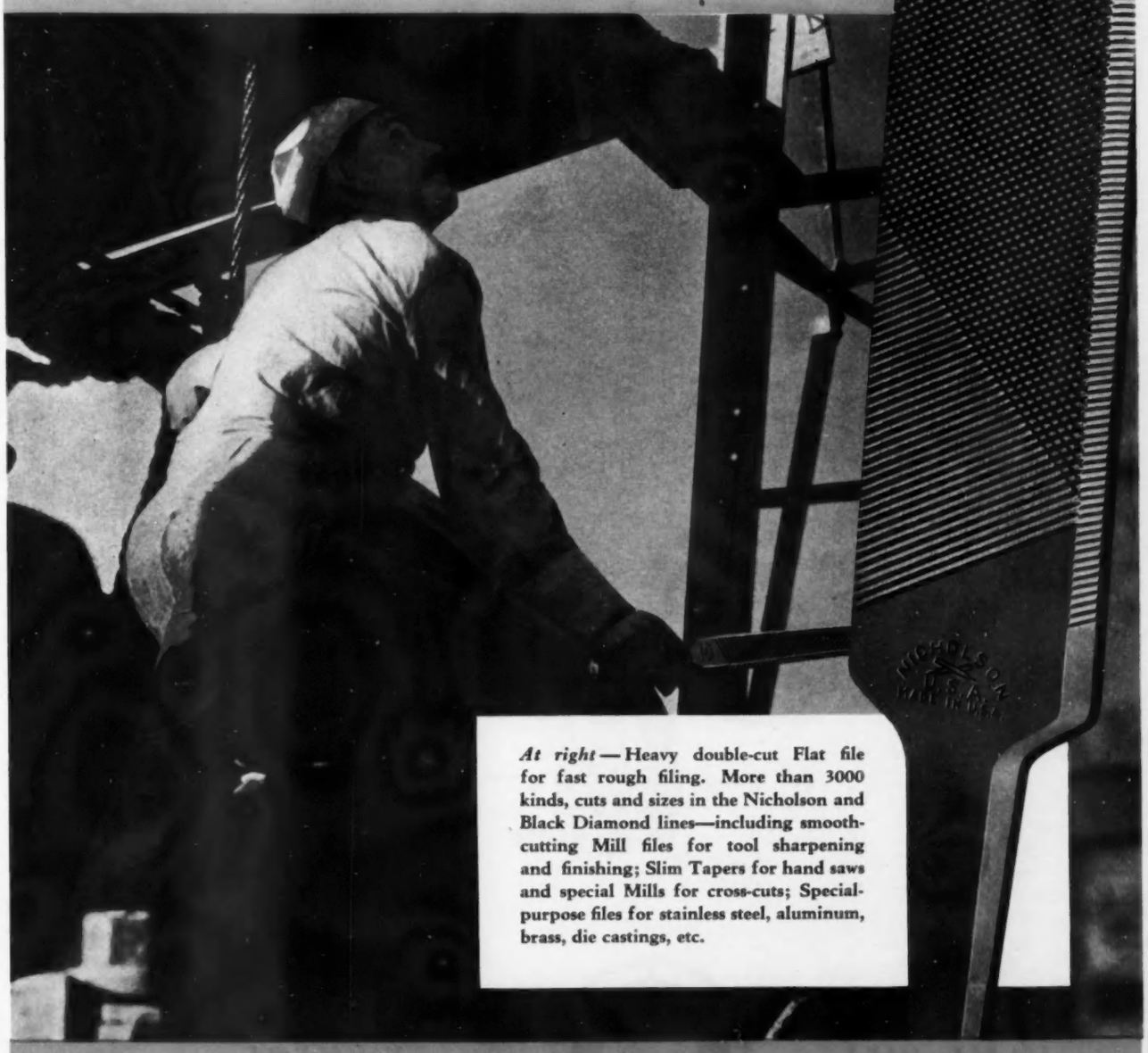

At right—Heavy double-cut Flat file for fast rough filing. More than 3000 kinds, cuts and sizes in the Nicholson and Black Diamond lines—including smooth-cutting Mill files for tool sharpening and finishing; Slim Tapers for hand saws and special Mills for cross-cuts; Special-purpose files for stainless steel, aluminum, brass, die castings, etc.

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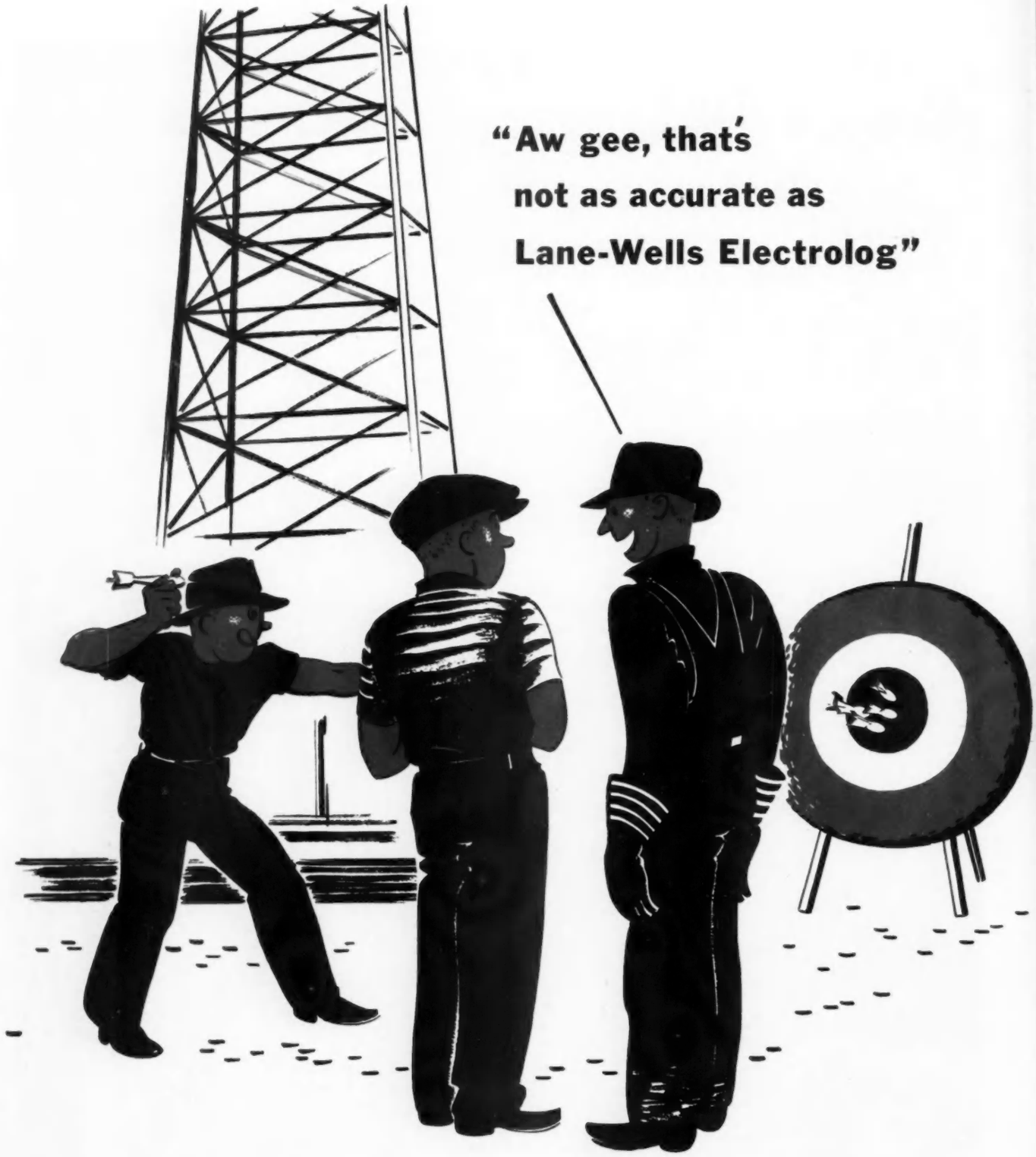

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Life on a Drilling Barge

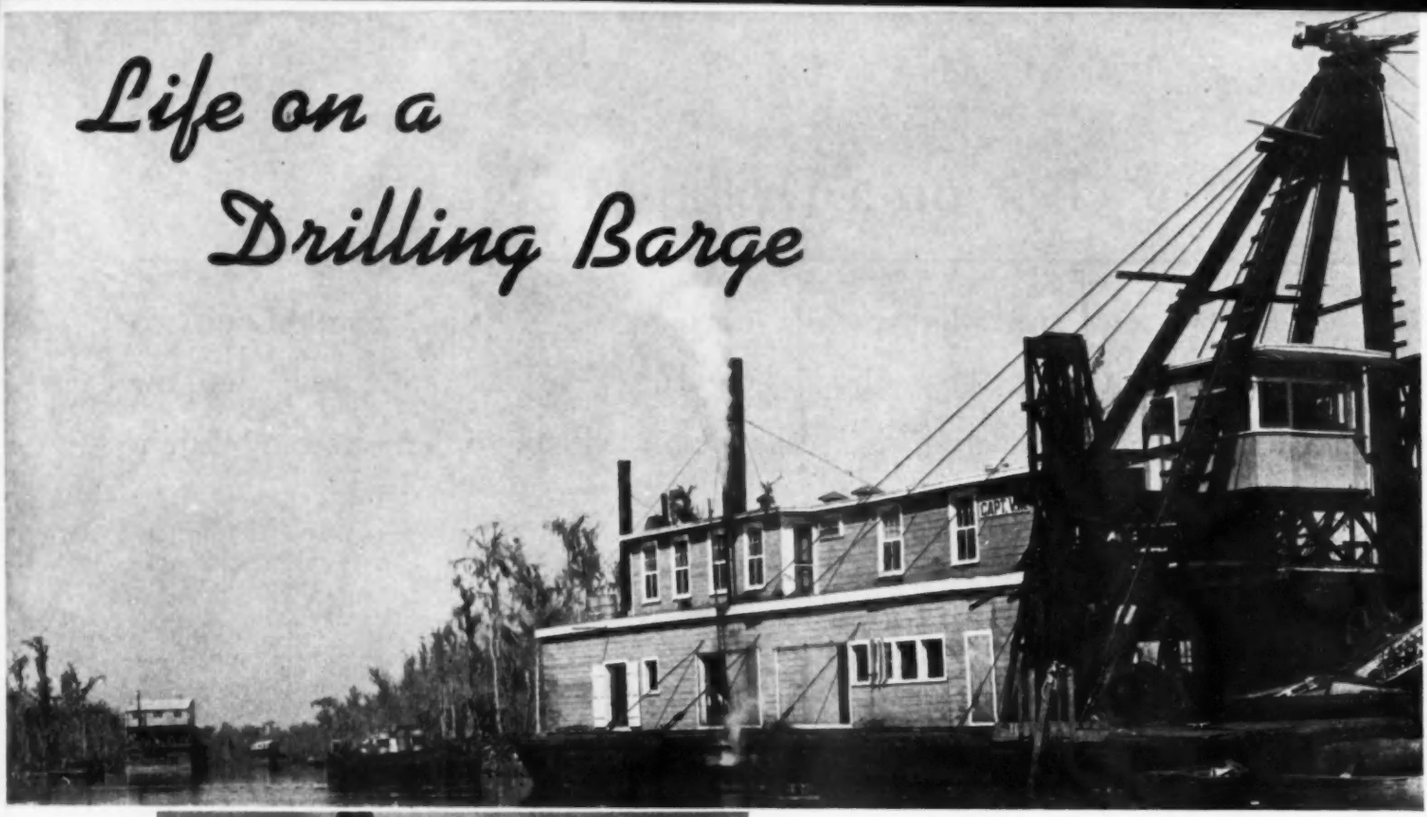
Or a few camera-lights while moving-in on a typical South Louisiana swampland location where the grader and the truck give way to the dredge and the pirogue and a $200,000 "floating rig" seeks oil in the home of the 'gator and Cajun.

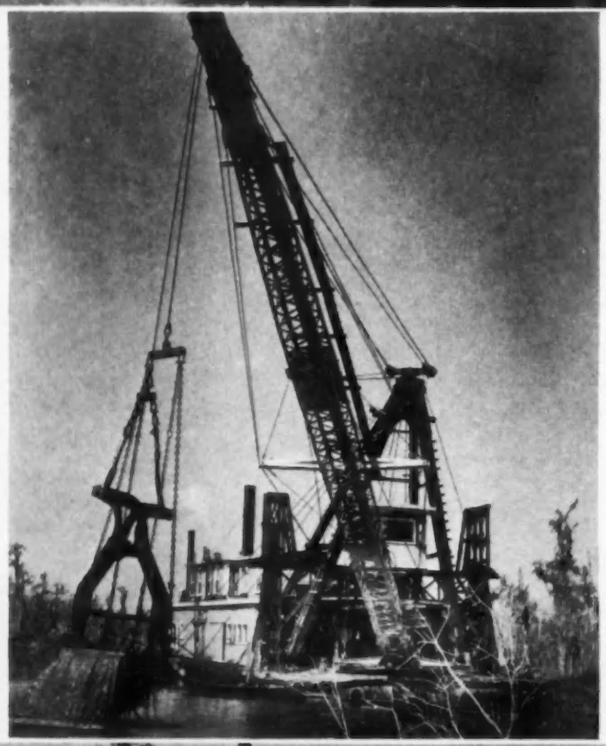
By WILLIAM H. STRANG

DOWN all the highways and byways of oil production there is one corner of the United States where operating conditions are as foreign to the experience of most American oil men as those of Alaska or Burma; one corner where the toughness of body and spirit that is the peculiar possession of the oil-field worker is frequently taxed to the limit to gain the objective. Taxed also is the operator's purse. In the swampland portions of South Louisiana are met and overcome surface obstacles that make the actual finding of oil an anticlimax. In this Acadian territory, where noisy oil craft ply the bayous that Evangeline once searched for the elusive Gabriel, there is a watery domain, covering a million acres, that lay untroubled for centuries

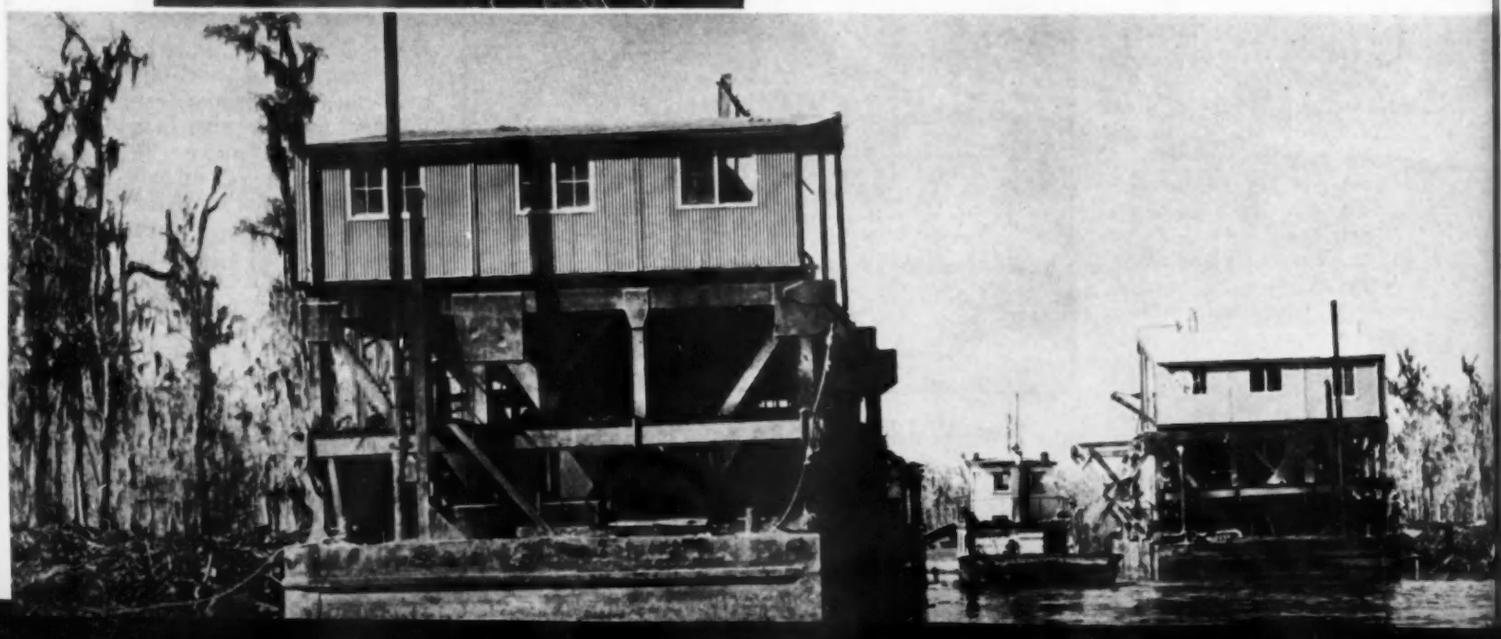
[*Continued on page 30*]

Life on a Drilling Barge

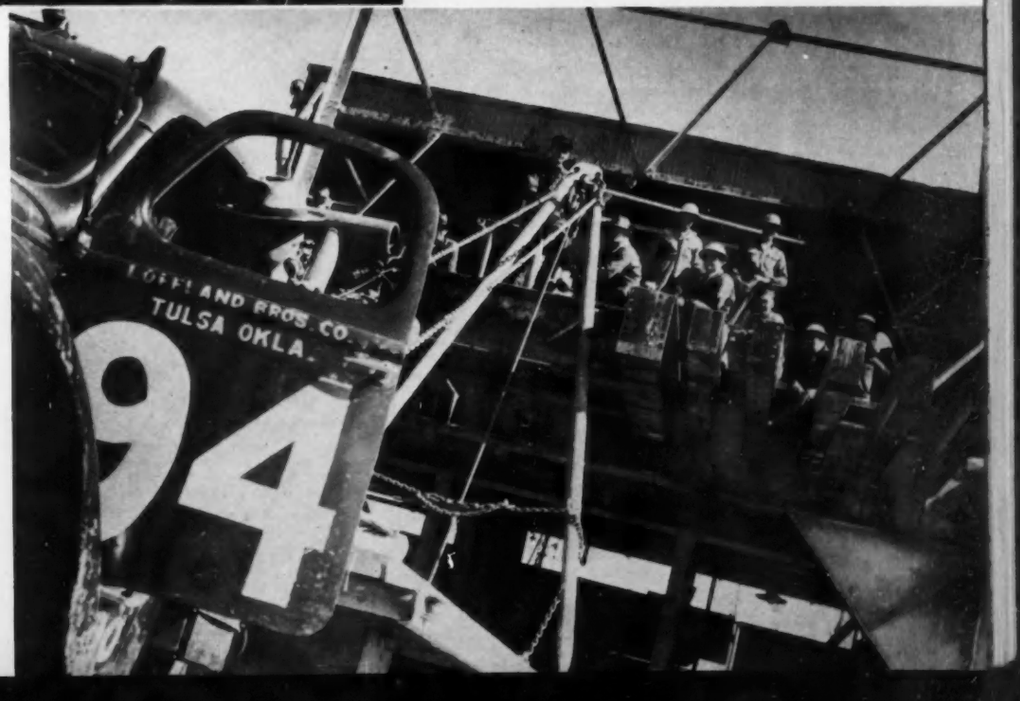


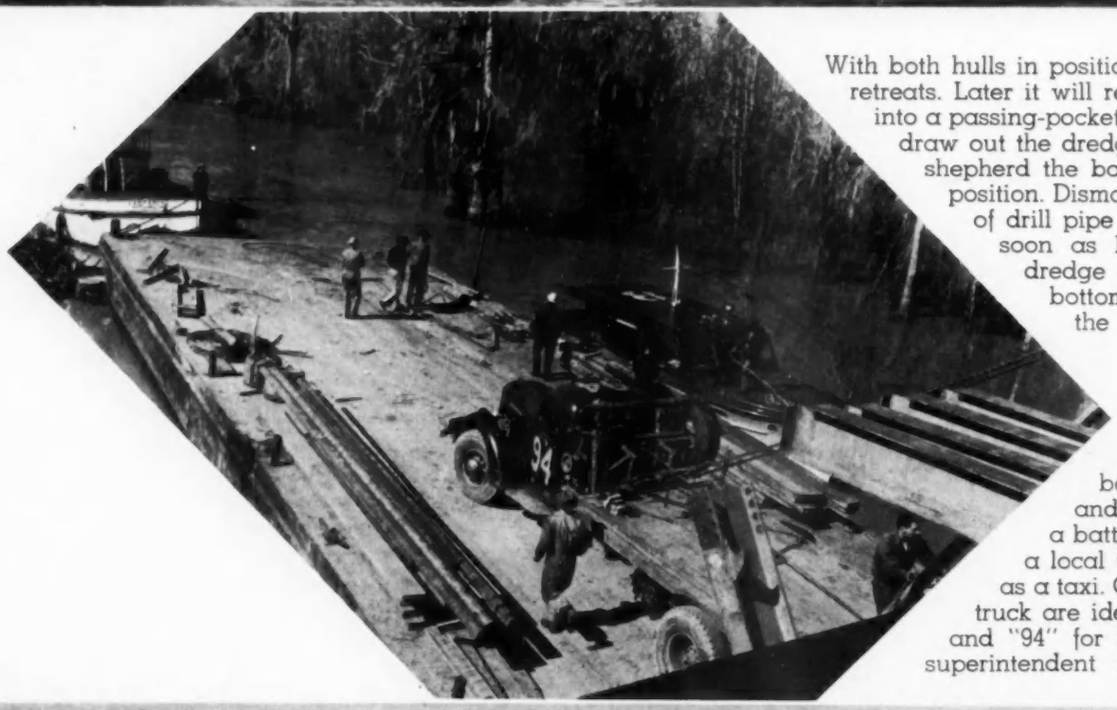


A Bayou Pigeon program usually is initiated by an expensive operation, the dredging of a canal through the cypress and tupelo gum swamp. Logging operations on large state leases have left many stumps which are persuaded by the dynamite on the barge behind the dredge. Each bite of the three-yard bucket costs the oil operator, in this case Plymouth Oil Company, about 30 cents. Cost of the 1100-yard, 100-foot-wide canal exceeds $7000. In the picture at top the drilling barge, shown split into its two parts down the canal, follows the dredge under the impetus of a deep-water tug, will drill its fourth well at the position of the upper half. The barge was moved from Galveston Bay through the Intercoastal Canal on a voyage attended by hard luck and the virtual loss of two light pleasure-type cruisers. The sand dredge is owned by Huth Construction Company, of Franklin, Louisiana, the drilling barge, a $200,-000 outfit exclusive of drilling equipment, by Loffland Brothers, of Tulsa, Oklahoma.



Eight-foot center section, which ties the two halves of the drilling barge together, is being installed with help of gin poles and winch-line on truck. Horizontal I-beams compose the base of the rig floor, boxing out a square to receive the rotary table. X-members at ends and center of barge form a union between halves rigid enough to withstand terrific vibration during drilling. As two derrick legs foot on each hull, any misalignment might cause dangerous weaknesses. When these spanning members have been attached, the tug "Arcadia" will nose the hull up-canal and jockey for position alongside the other half of the barge. Living quarters for the crew are on upper deck, in considerable confusion after the long haul from Galveston Bay.





With both hulls in position (above), the Arcadia retreats. Later it will return to nose the barge into a passing-pocket at the end of the canal, draw out the dredge, then return again to shepherd the barge back to its present position. Dismantled derrick lies on top of drill pipe and will be erected as soon as barge clears the sand dredge and is submersed. The bottom picture is a view from the other side.

These operations require trucks, truck barges, tugs, speedboats, and cruisers, not to mention a battered pirogue, piloted by a local fisherman, which serves as a taxi. Cruiser "Mary Ann" and truck are identified by numbers "8" and "94" for the convenience of the superintendent in a company plane.

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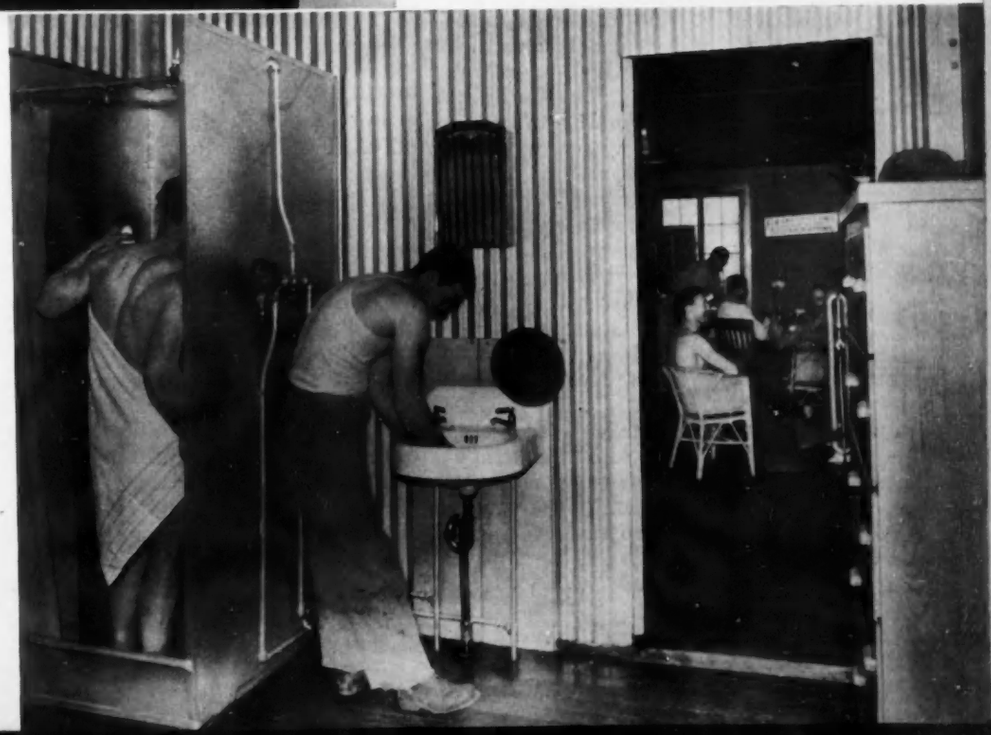
Sleeping accommodations for the crew are plain but comfortable. Fibre board walls help deaden rig noises. Another room, separated from this one (right) by the bathroom, has equivalent sleeping accommodation, but is less desirable on account of proximity to rig floor. Surf board leaning against window is home made and was used for diversion on Galveston Bay, but will probably not be used on Bayou Pigeon, as a dunking in the dirty water or an encounter with a cypress stump is not a pleasant prospect. Steam for heat is supplied from the drilling boilers, with electricity from the rig generators. Theoretically, one crew sleeps while another drills, while the third tour returns to civilization. Actually, extended recreation in town, or extra bunk fatigue split up the two off-duty tours. Tender leaves the boat at 8 a.m., 4 a.m. and midnight for the landing, 2 hours distant.

Galley on the barge is provided with kerosene refrigerator, butane stove, hot and cold water, electric lights, and commodious cupboards. Johnie, the cook, became experienced aboard a dredge.

Lavatory has shower, basin, large chest of drawers and a toilet serviced by a chemical tank below deck. As the job progresses magazines, cards, and various paraphernalia of amusement accumulate in the bedroom.



[Continued from page 25]
until the unflagging search for oil reached into the remotest corners to disturb the Cajun, the alligator, and the quiet.

The swamp has an eerie, dismal beauty, an atmosphere of mystery, which registered even upon a harried reporter concerned with "covering the waterfront" for its tangible yield of new ideas in operating technique. Acres of cypress and tupelo gum, with lolling undergrowth and flowers of many obscure species, lie in a tangled, impenetrable mass over still brown waters, sometimes invisible, but always there. Canals, bayous, and rivers twine and intertwine, but there are vast isolated patches that present a solid front against the entry of man or machine, and here, for many a long year, no one trod but the trapper and the muskrat quarry. Trappers and fishermen lived on homemade houseboats anchored in the tributary fingers of the main water trails, went to town twice a year, saw each other infrequently, were never troubled by the sight of a stranger in their own province.

With the entry of the oil business, no respecter of sylvan peace and placidity, all that has changed. Lest we become too lyrical about the swampland as Nature intended it to be, let us show it as the oil business has made it.

Small power craft churn the lonely bayous; Teche, LaFourche, Pigeon, Terrebonne, Des Allemandes, and a hundred others, some of them man-made for the express purpose. Oil barges and tugs crowd shrimp and fish boats at the wharves of Morgan City, Franklin, Buras, Lake Charles. Planes roar over drilling rigs and land on the water nearby. Drilling barges, boiler barges, and truck barges are towed and nosed along devious routes by small tugs. The Cajun in his long pirogue, coming out of a narrow inlet and vanishing into nowhere, is probably no longer tending his traps. In some areas it is a safe bet that he is running a message for tool-pusher or driller, or returning to the landing for the tool that someone forgot. Around Quarantine Bay, Garden Island Bay, and Venice, all on the Mississippi delta far below New Orleans, the crews are swart and brown-eyed speaking French explosively, English haltingly. Sometimes they do not take a lunch to work, just grab an oyster rake, fry oysters and brew their syrupy sweet coffee.

Not all of the natives are so easily won over. Some give up grudgingly as the swamp, or not at all. Most jealously held are the rights of the small boatmen whose living depends on fish or oysters. The courts of Louisiana are not tolerant of one who interferes with this occupation, and many a boatman in oil company service has "bought" a pirogue he has never seen, but swamped with the wash from his heavier craft. These swamped pirogue almost invariably contain 20 sacks of oysters, about a full load, to be included in the settlement. The Mississippi River pilot who learned to duck when he passed a houseboat has nothing on some modern oil boatmen, who cut the engine and try to sneak past on the far side of the channel, but are never surprised to see the houseboat dweller, enraged by the wash, pop out on deck with a rifle which he sometimes fires, sometimes just gestures menacingly.

Favor Canals

The swamp cares little for the encroachment, but loses in the end. Major employers of dredges in Louisiana are now the oil companies, who scorn a spongy road that is liable to disappear under high water, choosing to dredge canals, sometimes miles in length, on the theory that the higher the water, the better the canal, and the assurance that while the water may get low, it seldom disappears. If the location is in a marsh, with little woody vegetation, this is comparatively easy. In the cypress swamps the canal must be literally hacked and blasted out. A month is not a long time for this operation. Over marshland, piling may be driven to support the derrick and roadway, or the roadway may be a military style floating duckboard type.

Be the difficulties what they may, few have been found that have not been overcome by the resource of the men responsible for the job. Nearly every phase of the drilling operation on a "water job" is a little harder than one on land, but these operations are paying off, and in addition the companies who foot the tremendous bills, up to three to five times the cost of the ordinary land well, are getting an extra profit in the training they are giving their personnel, to be turned to advantage on the next job. The tool-pusher and the superintendent have the added responsibility of a remote location and a fleet of boats, and acquire more complete generalship because the boss gets around less often.

The accompanying scenes were taken on one of these South Louisiana swampland operations in the Bayou Pigeon field, in Iberia Parish, near the inner edge of the vast swampy area that surrounds Grand Lake. The field is a 1940 discovery of Plymouth Oil Company. Of the 16 fields found in Coastal Louisiana in 1940, 9 were in swamp or open water. The operation shown is not a strict exception to 50 similar in continuous progress in the territory, and so will serve to acquaint the unfamiliar with the natural obstacles to development, and the manner in which these operators and drilling contractors solve the problems of an inaccessible location.

The location is 25 miles by auto plus two hours by boat from Plaquemine, the nearest town. The entire 60 miles intervening are over terrain liable to be under water most of the time, and the route wends westward from Plaquemine through the Intercoastal Canal, Little Grand River, Bar Ditch and Bayou Little Pigeon on a path that only a native can follow. Thus Loffland Brothers, drilling contractors, found good use for a drilling barge fitted with sleeping and eating accommodations for the crew. There is nothing startling about the idea, and nothing palatial about the living quarters on a drilling barge, but it saves the men six hours each day, and saves the company money expended for non-productive man-hours spent in boat-riding to the isolated location. In addition it reduces the number of boat trips required to service the drilling barge, lessening the chances for expensive accidents. With a marine-type radio telephone on the tool-pusher's boat, the barge is in direct contact with land telephones. This instrument expedites the operation as a whole and has an appreciable effect on employe morale, doing much to relieve the feeling of isolation.

As to living conditions, there is nothing soft about the job, nor the type of men, except their hearts (something they conceal in every way they can find), so it is not surprising that the living is the same. Putting it all together, it demonstrates that the search for oil is in the hands of men who do whatever is necessary, leaving us to do the talking about it.

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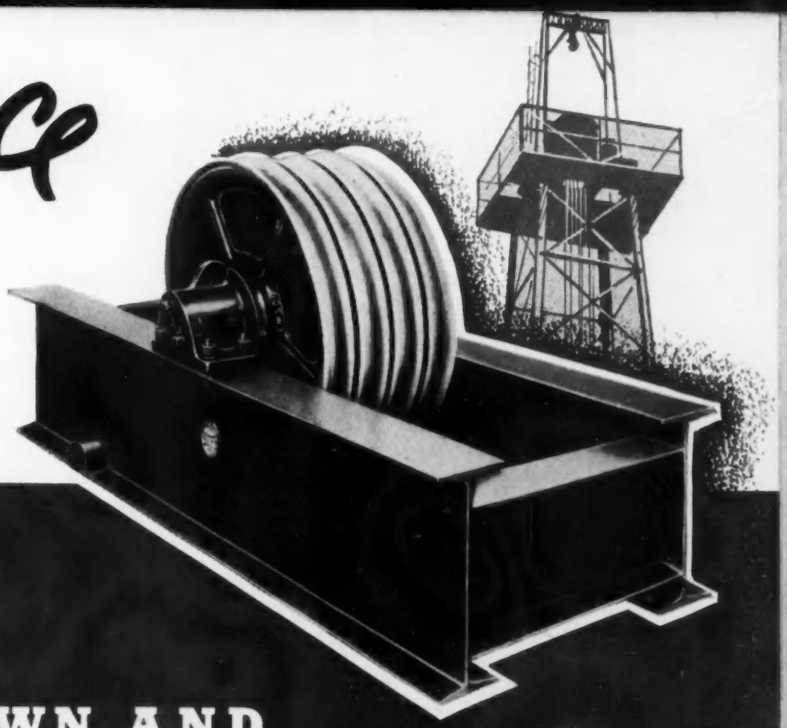
Performance UP AND DOWN



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Fitted with this 100-ton hook, it is not necessary to purchase hook bail or block becket.

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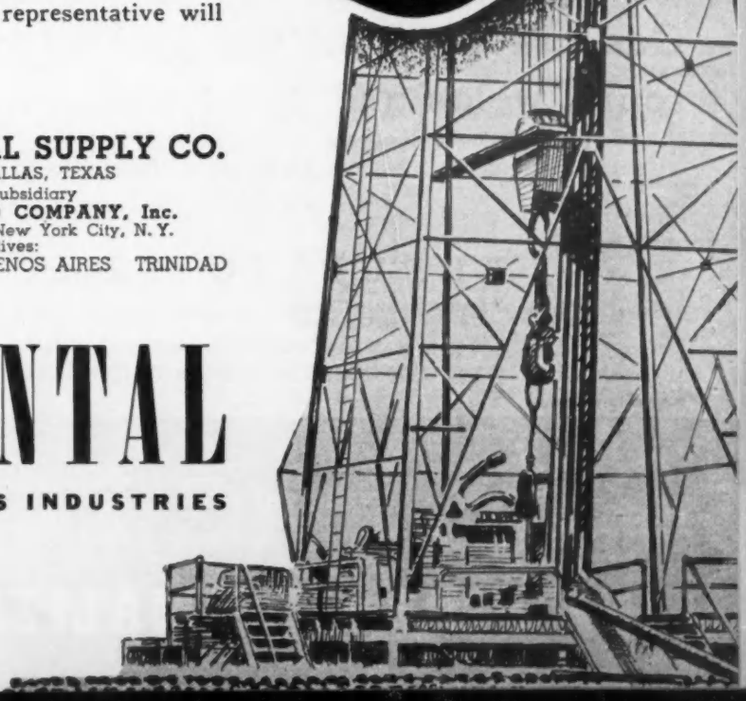

The Petroleum Industry today—like all American industry—is faced with its greatest challenge in history. It must carry out its share of a gigantic National Defense program and at the same time satisfy the normal needs of a prosperous nation. To do this requires steel products in unprecedented quantities.

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R. J. Wysor
PRESIDENT

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REPUBLIC ELECTRIC WELD

LINE PIPE—NORMALIZED CASING AND TUBING

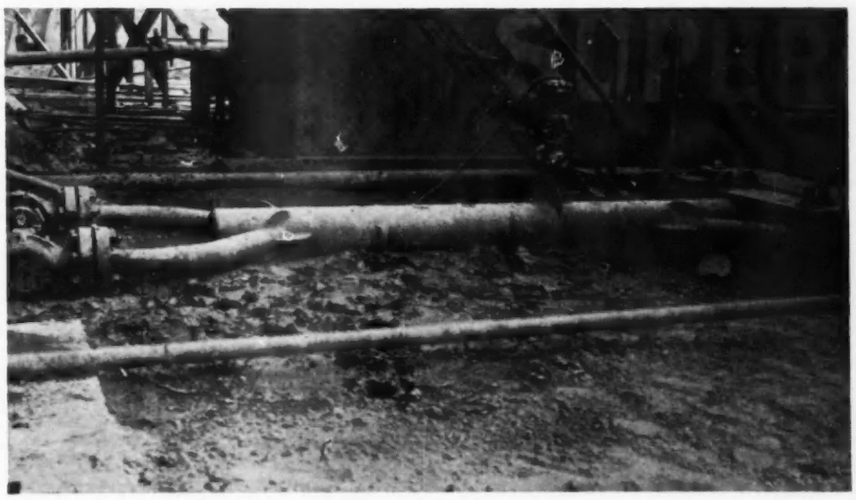
Practical Hints for the Drilling Rig

The following reports on rig practices contain suggestions of a practical nature, designed to improve operating efficiency and safety. These items come from all parts of the United States and give an excellent picture of the ingenuity being brought into play in drilling operations.

Contributions to this page will be paid for at the rate of $5 for each illustrated item accepted. Address contributions "The Editor, THE OIL WEEKLY, Houston, Texas."

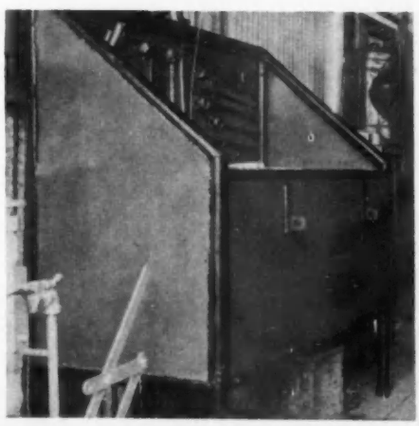
1. RIGGING UP

Enlarged Section of Discharge Piping Frees Air Chamber from Derrick Floor



An enlarged section of discharge piping serves to smooth out mud pump impulses.

TO ELIMINATE the air chamber in the mud line, frequently installed on the derrick floor, an enlarged section of the discharge piping may be provided to smooth out the impulses of the mud pumps. The outlet branches from each side about 16 inches from the end to form a small chamber at that point. The section is made of 12-inch pipe and is about 12 feet long, flanged at all connection points so it may be moved as a unit. A small chamber is attached near the center with a plug valve, single-bolt union and flanged head to which is connected the flexible line leading to the mud pump pressure gauge on the instrument panel in front of the driller.



This cabinet features flat desk top, tool rack, and a large storage bin.

2. TOOL CARE

Combination Cabinet Rack and Desk Top

A COMBINATION cabinet may be provided for the derrick floor, with a flat desk top for making reports, a rack for small hand tools, and bins below for storing supplies. The frame of the cabinet may be made of two-inch pipe with panels of light sheet metal. The flat desk top is made of a smooth sheet of metal, with the back equipped with pins upon which may be hung hammers, hatchets, hand saws and adjustable and socket wrenches. A compartment below may be provided with two doors, with hinges at the bottom. Rotating latches may be attached to the top, with lugs through which a rod can be passed for locking.

3. RIGGING UP

Extra Standpipe Hose For Emergency Use

SEVERAL contractors drilling in the deep San Joaquin Valley fields of California have found it advantageous to install an extra rotary hose and standpipe in the rig at the side of the one normally in use.

Due to high circulating pressures maintained in drilling deep wells, it is impossible to predict when the hose in use may blow out or spring a leak that would require a dangerous and costly shutdown of the mud circulating system. Because of the character of the formations and the heavy mud used, stuck drill pipe with a resulting washout or fishing job might easily result from such a shutdown.

In the event of trouble with one hose, it is necessary only to attach the spare hose to the swivel gooseneck and throw open a parallel set of gates in the mud line to restore circulation. One operator makes it a practice to reserve one hose of exceptional strength for use while drilling the deeper zones, for squeeze cementing jobs, and other

high pressure work, while a lighter hose is used for more shallow and low pressure drilling.

4. TRANSPORTATION

Sheet Steel Protects Car Grille Base

TO PROTECT the grille base and the front end of an automobile used in extremely rough and rutty country, a scooter consisting of a curved sheet or boiler or tank steel attached to the lower side of the front bumper and to the under side of the frame ahead of the axle or the knee-action cross member. When passing over obstructions, such as high earth centers, it will assist in smoothing down the heavy clods which might interfere with transportation across field roads.

A curved sheet of steel from bumper to body frame protects grille base of this car.

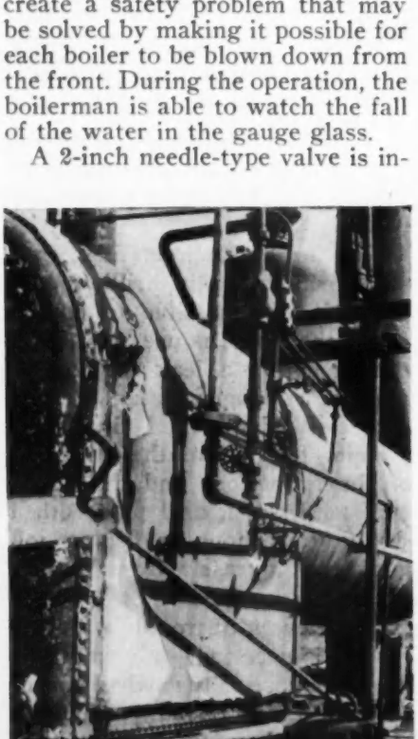
5. SAFETY

Lessen Danger When Blowing Boiler

POTENTIAL dangers that exist when a boiler is being blown down create a safety problem that may be solved by making it possible for each boiler to be blown down from the front. During the operation, the boilerman is able to watch the fall of the water in the gauge glass.

A 2-inch needle-type valve is installed a short distance from the down-stream side of the regular blow-off valve, and extending slightly beyond the outside of the fire-box wall and located so that the stem of the handle points toward the front of the boiler. A ¾-inch pipe is passed through a hole in a short piece of flat steel plate bolted at arm level to the front of the boiler, and is then extended downawrd to the valve. A universal joint of the automotive variety connects the pipe end to a simple steel bracket clamped to the valve handle. Two ¾-inch ells and two 6-inch nipples provide a convenient handle for quickly opening and closing the valve.

Normal operation in using the extension handle consists of first opening the regular blow-off valve, then, from the front of the boiler, quickly spinning open the other valve. When the gauge glass indicates that the water level is falling to a dangerously low point, the valve can be closed immediately, after which the regular blow-off valve can be closed.



The arrangement above provides a view of the gauge when blowing down boiler.

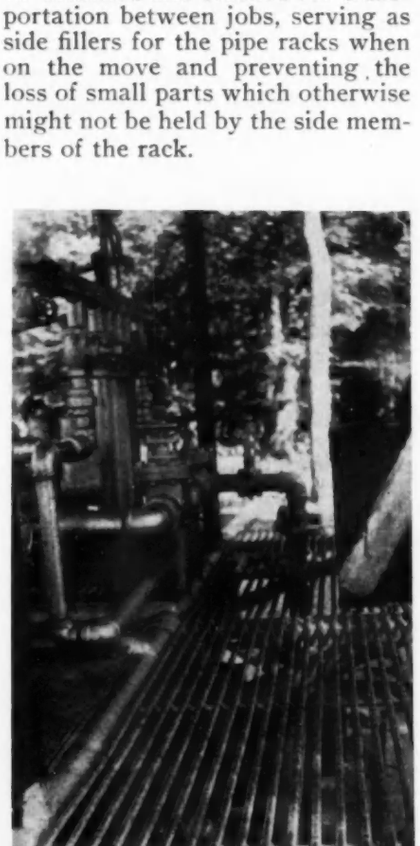
6. SAFETY

Sturdy Walks Made of Sucker-Rod Material

A PORTABLE extension to the standing provided by the plates welded within the frame of the feed-water pump skids is provided by one drilling company through use of walkways made up of sucker-rod material and attached to brackets on the skid frame.

The walks, with non-skid projections welded on the rods by simply striking an arc between rod and electrode and then breaking the current, extend along both sides of the skid. Their open construction permits water and mud to fall away and leave a clear surface for the fireman as he makes his rounds.

Made in sections, the walks may be detached and stacked for transportation between jobs, serving as side fillers for the pipe racks when on the move and preventing the loss of small parts which otherwise might not be held by the side members of the rack.



This walkway of sucker-rod material helps firemen when making his rounds.

HIGHLIGHTS IN THE WEEK'S NEWS

Legislation

Arkansas and Kansas Join, Wyoming Rejects Compact

State legislative activity was highlighted by formal entry of Arkansas into the Interstate Oil Compact, and final approval of a bill authorizing such action on the part of Kansas. Wyoming, meanwhile, rejected a bill providing for participation in the compact.

Governor Adkins of Arkansas, acting under authority of an act of the legislature approved earlier in the session, signed the compact, which was brought to Little Rock by W. J. Holloway, former governor of Oklahoma acting for Governor Leon C. Phillips, compact chairman, and Charles L. Orr, Oklahoma City, compact secretary.

Final legislative approval was given, and Governor Payne N. Ratner's signature affixed to a bill authorizing renewal for two years of Kansas' membership in the compact.

A bill authorizing Wyoming to join the Interstate Oil Compact was defeated by an overwhelming majority in the Wyoming Senate, where only two votes were cast supporting the bill.

Its failure to pass was due largely to opposition of operators who feared that the state's market would be limited to present outlets if the state entered into the compact. It was felt that the need for oil conservation in Wyoming is not urgent. The majority of the fields in the state are under unit operation, or have only a few operators in the field.

New Control Bill Looms; State Action Varied

Department of the Interior officials last week were reported working on a new oil control bill, to be suggested to Congress as a substitute for the Cole bill which was before the House Interstate and Foreign Commerce Committee throughout the last Congress.

Details of the projected measure were closely guarded, but there were suggestions that it will be more or less along the lines of the Cole bill but in such form as to allay the opposition of the oil states having control laws in operation.

Like many measures which have been proposed in the past six months, national defense will be invoked as the objective to be sought, and there may be some exploratory discussion of that angle at brief hearings which the House committee is expected to hold this month, at which, however, the pipe line situation is now seen as the major subject of consideration.

While Secretary of the Interior Harold L. Ickes continues to maintain that there should be closer cooperation between the federal and state governments and the oil industry toward elimination of waste, defense officials have given no indication that they are interested, although late last year they were represented as apprehensive over the ability of the oil industry to meet the petroleum needs of the defense program. Due to their lack of interest, the oil group of the House committee abandoned plans for hearings on that matter.

Meanwhile, hearings before the Temporary National Economic Committee on suggestions for legislation to be incorporated in its report drew toward a close last week without any reference having been made to oil, although that industry was one of a number thoroughly investigated by the committee in 1939-40.

No Justice Recommendations

Appearing before the committee to submit the recommendations of the Department of Justice, Assistant Attorney General Thurman Arnold last month failed to make any mention whatever of oil, explaining privately that he saw no need for legislation affecting the industry and expressing the belief that whatever monopolistic practices existed would be dealt with by the suit now pending in the District of Columbia federal court.

Officials of the Securities and Exchange Commission appeared before the committee last week, and also failed to offer any suggestions for the control of the oil industry.

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Allowables

Kansas Increases March Allowable 2000 Barrels

The Kansas Corporation Commission last week set the March allowable at 198,200 barrels, an increase of 2000 barrels over the February figure and 4000 barrels above the estimate of consumer demand issued a week ago by the United States Bureau of Mines.

Louisiana March Allowable Above Bureau Demand Figure

The Louisiana Minerals Department last week set the state allowable for March at 306,190 barrels, an increase of 11,248 over the February allowable figure and 14,890 barrels over the 291,300-barrel estimate of demand issued for the state by the United States Bureau of Mines.

South Louisiana fields were boosted 9414 barrels to 236,722 barrels, while North Louisiana fields were allocated 69,468 barrels.

Texas Adopts Parity Plan In Lowering March Figure

Texas allowables were revised drastically in a new statewide proration order issued by the Texas Railroad Commission February 28. The commission attempted to base the order on parity, giving each field the same allowable where producing conditions were the same.

In a prepared statement issued by Commissioners Jerry Sadler and Olin Culberson, who signed the order, the commission said:

"In preparing the allowable order issued today, the commission has attempted to establish parity between like fields insofar as producing conditions in the various fields and the prevention of physical waste would permit.

"In establishing these allowables, the commission took cognizance of the fact that the types of crudes produced are different even within the railroad commission districts, and that the demand for these types of crude varies. However, except for those fields where producing conditions did not permit or where there was an insufficient market demand, a uniform yardstick was used for all of the fields producing a particular type of crude.

"Consideration was given to the depth of the wells and to the spacing programs in effect in the different fields in the state, in that as the depth at which production was found became greater, the allowables permitted were greater, and the fields having wider spacing programs were permitted to produce at higher rates."

Sadler, who gave out the prepared statement, declined to give details of the formula used. However, he said that the commission considered five grades of crude: Mirando (producing less than 10 percent gasoline), low-octane, intermediate-octane, high-octane and low-cold-test.

The order is effective March 10.

Sadler said that the net daily average allowable, as estimated by the commission, would be 1,305,152 barrels, or 22,248 bar-

rels below consumer demand as estimated by the United States Bureau of Mines. He said that the net daily allowable would be 1,352,489 barrels, but that generally operators under-produced the allowable by 3½ percent, which would amount to 47,337 barrels in this case.

While scheduled allowables remained high, the commission effected the cut by providing all fields would be shut down for ten days of the month. The same fields were exempt that were exempt in February. Shutdown days are March 2, 8, 9, 15, 16, 22, 23, 29, 30 and 31.

The Panhandle district, however, is to be closed in only five days, March 2, 9, 16, 23 and 31. It was closed down six days in February.

East Texas is to be closed nine days, will be permitted to operate on March 29, but will be closed when other fields are closed on the shutdown days remaining.

Texas Reaffirms Pledge to Uphold Bureau Estimates

Announcement made by two members of the Texas Railroad Commission at a statewide hearing last week, to the effect that Texas allowables would not exceed United States Bureau of Mines estimates of demand during 1941, may have unusual significance for the oil industry. The month before, the commission had not changed one allowable figure after the statewide order was issued, and the allowable was kept well within the bureau's estimate. The statement of policy, which in itself was not new, therefore, became highly significant.

Commissioner Olin Culberson was the first to state from the bench that he did not intend to approve an order that provides for an allowance in excess of bureau estimates, because he thought such a move would exactly suit advocates of federal control in Washington, and he had no intention of playing into their hands.

Shortly thereafter, Commissioner Jerry Sadler joined with Culberson in this stand. During the past few weeks, the two commissioners have worked in close harmony.

For years, operators have urged the commission to limit production to bureau estimates. At the hearing last Monday, no sooner had the enunciation of policy been made, than the very same operators objected. They declared that bureau estimates recently had been fallacious, and that during the month of January, the true demand exceeded the bureau estimate by 41,000 barrels a day.

R. E. Hardwicke, Fort Worth attorney, objected seriously to the inclusion in the official record of any statement which would commit members of the commission to a policy before evidence had been offered. This, he declared, was federal control now, especially if the commission was going to consider only the estimate of the bureau. He pointed out that the statute provides for a study of all evidence that may be submitted to the commission, and determination of market demand based on all the evidence. He doubted the legality of such procedure, and asked that the statement of the commission in this respect be stricken from the record. Commissioner Sadler declined to strike the statement.

Commissioner Ernest O. Thompson did not attend the hearing because of illness of his mother.

Urge Washington Pressure

The commissioners also urged that operators and the associations with which they are connected appear in Washington and attempt to obtain increases in the bureau estimate of Texas demand. Culberson charged that the bureau was charging to Texas as excess storage all of the gasoline which was derived incident to the producing of burning oils, although the crude from which these burning oils were refined was brought into Texas from other states. He declared this resulted in weak spots in the gas market near Texas refineries handling these products, and that these weak spots were in no wise due to excess production in Texas.

For the first time in the history of Texas proration, it appeared that producers might have a strangle-hold on some purchasers. For years, operators contended that there was discrimination between fields in fixing allowables, in other words, that some fields received higher allowables than others, although producing conditions and the grade of oil obtained were identical.

The commission appears to be inclined to place all such fields on a parity basis, and to allow production of a supply of oil equivalent to the total demand taken from nominations filed by the purchasers. Should this plan be applied, large purchasers with wide pipe-line systems connected to many fields would retain a healthy position. However, companies whose lines were laid to only a few fields might find themselves in a position where they would either have to buy more oil from those fields than they desire, or else they might have to go to other fields to supply their demands.

The situation of Phillips Petroleum Company in the Panhandle district, and of Gulf Oil Corporation in West Texas, were cases in point. Phillips Petroleum Company wanted more Panhandle crude for its Panhandle refinery. Only seven days' supply was on hand when the hearing was held, and the company said that no other oil was available.

Gulf Oil Corporation asked for an increase of 15,000 barrels daily to be obtained from 16 West Texas fields to which it is connected. Should the commission apply the parity theory to West Texas as a whole, some of these fields would be increased and others reduced, and it is doubtful if the company would get the additional oil it asks for, and its

[*Continued on page 45*]

Rex Baker, attorney for Humble Oil & Refining Company, in the picture at top, is shown making a plea before the Texas Railroad Commission's state-wide hearing for an increase for his company in allowables for Gulf Coast low-cold-test oils. Below shows Commissioner Jerry Sadler, at microphone, questioning Baker on the validity of his request, being prompted by his colleague, Olin Culberson. In the foreground of the picture at top is C. A. Warner, Houston Oil Company of Texas.

World-Wide Developments

Venezuelan Test Shows Oil at Several Levels

Standard Oil Company of Venezuela tested El Roble 3, obtaining production at several levels. In a test made at 9450-9530 feet, the well produced 43.8-gravity oil at the rate of 936 barrels daily through a ⅜-inch choke. Simultaneous tests made at 9627-50 and 9790-9815 feet showed about 1300 barrels through the same choke, the oil being 46-gravity. Tests were being made at other levels.

The company's El Roble 4, not yet completed, encountered a sand at 8053-8081 feet. This test, now below 9300 feet, may be completed by the end of the month. Oil and gas shows are favorable, as were results of an electric log.

Ultramar S.A.P.A. Drilling Two Argentina Wildcats

In Argentina, Ultramar S.A.P.A. was drilling two wildcats. One well, 100 miles west of the city of Santa Cruz, was down around 800 feet, and the other, in the state of Salta and 120 miles north of Tucuman, was drilling at about 2000 feet.

Set Casing at 7425 Feet In Barco Concession Test

Colombian Petroleum Company last week was cementing 7-inch casing at 7425 feet in Socuavo 1, on the Barco concession, Colombia. Top of the Cretaceous was at 7447 feet, in the La Luna formation. The well is primarily a test of the Cretaceous.

The company's second Tres Bocas well on the concession is expected to begin making hole around the end of March. A ¼-mile road was being built to the location.

In two or three months, the company expects to begin drilling a wildcat on the South Sardinata structure, three miles west of the Petrolia field and south of the Tres Bocas area. The location is on the Barco concession. A 3-mile road is being constructed to the site.

Resume Operations in Peru's Aguas Calientes Field

Blue Goose Oil Company (Compania de Petroleo Ganso Azul, Limitada) has resumed operations on its concession in Eastern Peru, in an attempt to define the producing area of the Aguas Calientes field, on the eastern slope of the Andes mountains. A good producing well has been completed 300 meters south and slightly west of the No. 1, estimated to have made 120 barrels an hour through 2-inch tubing during a short incomplete test. At present, another well is being started 300 feet north and a little east of the discovery location.

The Aguas Calientes field produces from lime at depths ranging from 1020 to 1250 feet. The first well was completed February 26, 1939, at 1174 feet. No attempt is being made to produce the oil, as the field is without outlet. Equipment entry is by way of the Amazon River and its upper tributaries, a 3000-mile trip from the mouth of the river. Aguas Calientes is 300 miles northeast of Lima, and most of this distance can be made by auto in two days, although heavy equipment cannot be moved over the route.

Medium weight rotary equipment is being used.

Farish Denies Sales to Both Sides of European War

Charges that Standard Oil Company of New Jersey was selling oil to both sides in the European war were categorically denied last week by W. S. Farish, company president, in a letter to Senator Walter F. George.

Allegations that the company was dealing with both sides were made earlier last month before the Senate Foreign Relations Committee by Joseph Curran, representative of CIO shipping unions, during hearings on the lend-lease bill, and were also voiced in the House of Representatives by Congressman John M. Coffee. Both men charged that Standard Oil Company subsidiaries have been shipping oil to Teneriffe, in the Canary Islands, for transhipment in Axis tankers to Germany and Italy, while also shipping to British destinations.

"It is true that several cargoes of crude oil, gasoline and fuel oil have been shipped in tankers flying the Panama flag from Caripito, Venezuela, and Aruba, Netherlands West Indies, to the Compania Espagnola de Petroleos, S.A., at Teneriffe, Canary Islands," Mr. Farish wrote George.

However, he explained, "all shipments made by our subsidiaries to Teneriffe have been fully covered by British navicerts (clearance by British authorities), a procedure with which our State Department is fully familar. To our knowledge, not a single barrel of these cargoes has ever been picked up by Axis tankers or has been delivered to Germany."

Laying Water Line for Libertad Area Wildcat

Mene Grande Oil Company is laying a 5-mile, 4-inch line from the Querecal River to Quiamare 1, wildcat in the Libertad district, eastern Venezuela. A few weeks ago the water supply for the well ran low and necessitated this step.

Quiamare 1 is down less than 200 feet. It is situated in new territory, at a point 10 miles east of the Mene Grande road and pipe line to Puerta La Cruz.

Pipe Lines

Pipe on Ground for Loops On Stanolind Main Line

Pipe has been delivered for the construction of the first of a series of loops authorized last January by Stanolind Pipe Line Company to enlarge the capacity of its multiple system from North Texas to Whiting, Indiana, involving an aggregate of about 260 miles of line. The new loops will also facilitate segregation of Gulf Coast and East Texas field oil that will be routed through the system beginning about April 1.

The initial program is slated to be completed by mid-June and involves the laying of two 8-inch loops aggregating 31.7 miles, and a 9.64-mile 12-inch loop between Rogers Junction, North Texas, and Fox Junction. Two 8-inch loops aggregating 26 miles and a 8.31-mile 12-inch loop, will be built between County Line Junction and the South Canadian River. B & M Construction Corporation was awarded contract to install the above units.

Two Crews Working on Line to Serve Slaughter

Two construction crews are at work on Sid Richardson, Fort Worth producer, and associates' recently authorized pipe line outlet for the Slaughter field, Hockley County, involving a 40-mile 6-inch discharge line from field booster station and tank farm situated immediately southwest of Sundown and terminating at Aloco Pipe Line Company's Riley station near the south edge of the Wasson field. The latter will relay the oil sold by Richardson et al on contract to The Atlantic Refining Company to Atlantic Pipe Line Company's Hobbs New Mexico, trunk line terminal.

Aloco Pipe Line Company's organization is building the carrier for Richardson et al, and is using a second crew in laying about 20 miles of 6- and 4-inch gathering lines in the Slaughter area. Gravity flow will be utilized in gathering a large percentage of the oil. The Slaughter field booster station site is near center of south ½ Labor 59, League 39, Maverick County School Lands. A 55,000-barrel storage tank and a 10,000-barrels stock tank will be erected at this site, and similar tankage is scheduled for the delivery point on Aloco Pipe Line Company's system. The Slaughter field outlet is due to be completed by April 1.

Magnolia Building Two Lines Jim Wells to Corpus Christi

Magnolia Pipe Line Company and Magnolia Petroleum Company have authorized construction of pipe lines from Jim Wells County areas to their Corpus Christi terminal to handle crude and distillate, respectively.

An outlet for the high-gravity crude produced in the Premont district will be provided by Magnolia Pipe Line Company through construction of a 51½-mile carrier with a rated capacity of 10,000 barrels daily using one booster. This line will comprise 6-inch diameter welded pipe, excepting 6½ miles of 8-inch on the Corpus Christi end.

Magnolia Petroleum Company will construct a 12-mile 4-inch unit from the La Gloria field to Premont, then parallel the above oil line with 51½ miles of 6-inch to Corpus Christi. A booster at La Gloria will be rated at 6000 barrels daily. The

company has contracted to purchase the output of the La Gloria Corporation's cycling plant, which will have a capacity of 3500 barrels daily. Other plants in the area may be connected to later.

Williams Brothers Corporation was awarded contracts to build the Premont-Corpus Christi units. Both are due to be completed by mid-April. Separate crews will be assigned the two lines, which will be strung about 6 feet apart and in individual trenches.

Shell Building 90-Mile California Oil Line

Shell Oil Company has announced plans for construction of a 90-mile, 10-inch pipe line from Ventura Avenue field, Ventura County, to refineries and tank farm in the Los Angeles harbor district. It will be the first line to serve the field, located practically on tidewater.

Plans for the line are being drawn, and it is expected that contracts can be let within 30 days. Completion is expected not later than July 1.

Announce 15-Mile 6-Inch Michigan Junction Oil Line

Leonard Pipe Line Company will build 15 miles of 6-inch welded line from a junction on Sohio Pipe Line Company's 8-inch line between Toledo, Ohio, and Mt. Pleasant, Michigan, to start at Riverdale and run to Alma. The line will largely replace a 4-inch line operated by the company between Alma and Sohio Pipe Line Company's Crystal station farther south.

The new line is part of a program to facilitate increased delivery of Illinois crude oil to central Michigan refineries.

New Company to Operate Arkansas-Shreveport Line

Oil Pipe Corporation has been organized by M. E. Florence, Dallas oil operator, S. S. Nossek and M. Harwood in connection with their recent purchase of 82 miles of 10-inch line from the Texas Pipe Line Company between the Smackover, Arkansas, district and Shreveport. The latter has discontinued operations in Arkansas and North Louisiana following abandonment of The Texas Company's refinery at Shreveport. Purchasers of the line propose to utilize same for transporting gas from the Cotton Valley field.

Finish Pipe Line to Take Opelika Distillate Output

Construction work on Gulf Refining Company's 37-mile 4-inch welded line, extending from the Opelika field, Henderson County, to Big Sandy station on its East Texas trunk-line system, is scheduled to be completed this week. The company has contracted to purchase a maximum of 5000 barrels of 60-gravity distillate daily for 5 years from the Opelika cycling plant of the Shamrock Oil & Gas Company and Lone Star Gasoline Company.

Short Michigan Line

Bay Pipe Line Company is constructing three miles of 4-inch oil line from the Monitor field, Bay County, Michigan, north to a junction on the company's 6-inch main line between the Buckeye field and Bay Refining Company's plant at Bay City.

Associations

Pacific Coast API Plans Spring Meeting March 11

The Annual Spring meeting of the Pacific Coast District, American Petroleum Institute's Division of Production, will be held in the Biltmore Hotel, Los Angeles, Tuesday, March 11. The program includes morning and afternoon technical sessions, at which six papers will be delivered, to be followed by a dinner meeting in the evening.

E. W. Webb, Continental Oil Company, will preside at the morning session. Papers to be presented will include:

"Recently Developed Methods for the Inspection of Tubular Goods and Sucker Rods," by Hugh M. Henderson, Standard Oil Company of California;

"Some Factors Which Influence the Choice of Drilling Equipment," by V. J. Beissinger, Richfield Oil Corporation, and

"Voluntary Curtailment Program of California Oil Producers," by A. H. Bell, Continental Oil Company.

At the afternoon session, T. H. Acres, Richfield Oil Corporation, will preside. Papers to be presented include:

"Vocational Training in Oil and Gas Production," by W. L. Bagby, Shell Oil Company;

"Core Analysis Interpretation," by Norris Johnston, General Petroleum Corporation, and

"Recent Equipment for Paraffin Removal, Perforation Cleaning and Well Completion," by Benton Turner, Drilling & Exploration Company.

At the evening dinner meeting, R. N. McMaster, Chanslor-Canfield Midway Oil Company, will preside, and Arthur H. Young, California Institute of Technology, will deliver the principal address. His subject will be "Industrial Relations."

Mid-Continent API Group Plans March 21-22 Meet

Three speakers on subjects of general interest have been scheduled for the spring meeting of the Mid-Continent District, American Petroleum Institute's Division of Production, to be held in Amarillo, Texas, March 21-22.

H. M. Stalcup, vice president of Kelly Oil Company, will discuss relationship of the oil industry and its readiness and preparedness to serve the nation in its present emergency; Andrew F. Schoeppel, chairman of the Kansas Corporation Commission, will discuss "State Regulation of the Oil Industry," and J. H. Mitchell, director of industrial relations for The Carter Oil Company, will discuss personnel relationships in the oil industry. The three addresses are scheduled for Friday afternoon, March 21, 1941.

Secondary recovery in the Mid-Continent area will be discussed during one session, with the following papers in the course of preparation:

"Secondary Recovery in the Rocky Mountain Region," by C. F. Barb, Colorado School of Mines, Golden, Colorado;

"Water Flooding in Oklahoma," by L. M. Arnold, Geologic Standards Company, Tulsa;

"Water Flooding in Kansas," by R. C. Earlougher, Geologic Standards Company, Tulsa, and

"Secondary Recovery, Nowata Area, Oklahoma," by L. L. McWilliams, Phillips Petroleum Company, Bartlesville, and R. M. Carr, Sinclair Prairie Oil Company, Tulsa.

Another session will deal with care and economics of internal-combustion engines, gas-lift developments and acidizing, with the following subjects to be discussed: "Care and Maintenance of Diesel Engines," "Economics of Multi-Cylinder Engines in the Oil Industry," "Gas-Lift Developments," and "Gas-Well Acidizing in the Texas Panhandle."

A fourth session will treat of the following problems: "Method of Determining Well Potential by Pressure of Fluid Level Draw-Down Measurements," "Kansas Oil-Well Cementing Problems," "Use of Gel-Cements in the Mid-Continent Area and Their Properties," "Measurement of Oil and Gas Shows in Drilling Mud," and "Installation and Maintenance of Oil Field Tanks."

Houston Contractors Group Schedules First Meeting

The Houston District, American Association of Oil Well Drilling Contractors, will hold its first meeting March 6, at 10 a. m. in the Lamar Hotel. Drilling contractors, supply company representatives and oil operators have been invited to attend.

J. E. Brantley, association president and head of Drilling & Exploration Company, Los Angeles, will be the principal speaker.

Kansas Governor Condemns Threatened Federal Control

Governor Payne N. Ratner, of Kansas, addressing the Petroleum Accountants Society of Oklahoma in Tulsa last week, decried a "movement to force us to surrender our rights of self-government and to permit concentration and centralization of control under the federal government."

The governor made it clear that he was not denying that the United States was facing an international crisis, and that there should be no interference with national defense, but added that "neither is it a time to demand, in the name of defense, the seizure of further powers which should be reserved to the states."

The speaker declared "there are too many instances of federal control injuring our people," and asked for a "division of authority, properly allotted to the federal and various state governments, in accordance with conditions and constitutional rights."

"The manner in which a number of our states have banded together in a cooperative way to regulate the oil industry offers a splendid example of how states, exercising their constitutional rights, can work together and solve their own problems," the governor added. "We think the record of the oil compact, to which the Mid-Continent oil states belong, proves that such federal domination is unnecessary."

National Defense on A.A.P.G. Convention Program

National defense will have a prominent place on the program of the twenty-sixth annual convention of the American Association of Petroleum Geologists, to be held in Houston April 2-4. The association was organized in 1917, just as the United States was preparing to enter the first World War, and at the 1941 convention two of the principle speakers on the general program will discuss the relationship of oil and geology to the current conflict.

Dr. Robert E. Wilson, president of Pan-American Petroleum & Transport Company and head of the Petroleum Section, Raw Materials Division, Advisory Commision to the Council of National Defense, will discuss "Petroleum and the War." The address is scheduled for Thursday morning, April 3.

Dr. L. C. Snider, association president and head of the department of geology, University of Texas, will discuss "Petroleum Geologists in the National Defense Program" in his presidential address, scheduled for the same morning.

Dr. Snider has made valuable contributions to the literature of geology during his career, which began in 1909 when he received his master's degree from Indiana University. His "Earth History" is an authoritative work, and he contributed two valuable articles to the book "Problems of Petroleum Geology." He received his doctorate in 1915 from the University of Chicago. From 1925 to the first of this year, he was a consulting geologist in New York.

Southwestern A.P.I. Meets With 600 in Attendance

E. P. Hayes, The Texas Company, Houston, was elected chairman of the Southwestern District, American Petroleum Institute's Division of Production, when the organization held its annual spring meeting in Shreveport last week. Registration at the two-day event reached 562, with several sessions having more than 600 persons in attendance.

Hayes, who served as the district's program chairman last year, has long been active in the affairs of the institute. He is a past chairman of the Houston chapter, and is vice chairman for the Gulf Coast section of the Southwestern District. He is also active in studies of the Central Committee on Drilling and Production Practice, and on standardization matters. He holds a degree in mechanical engineering from Case School of Applied Science, and has been with The Texas Company since 1933 when he left the United States Bureau of Mines.

L. A. Ogden, district chairman, presided at the general session and introduced speakers and guests.

Endeavoring to present the salient facts in the European oil situation at the outbreak of the war, and to indicate the manner in which the course of war thus far has modified that situation, W. B. Heroy, Pilgrim Exploration Company, discussed "Oil and the European War," pointing out that practically all the oil produced on that continent came from Rumania and the Soviet Union.

Not until Germany overran Rumania, however, did it add to its available petroleum reserves otherwise than in capturing stocks already above ground and in most instances refined for immediate use. With Rumania now Nazi-controlled, it appears that Germany and the Axis are supplied with more than their prewar, and peace-time needs of petroleum supplies. The transportation problem, still a serious one, prevents speedy movement of this oil to the countries where it appears to be needed.

From the location of oil reserves in Rumania, it appears that Germany plans to base operations around this oil supply, with intensification of campaigns in that sector awaiting only favorable weather conditions for the maneuvering of mechanized troops.

With the occupation of Rumania, Heroy concluded, it accordingly appears probable that Germany has obtained access to sufficient supplies of petroleum to care for military requirements. Petroleum starvation is unlikely to bring about the defeat of the Axis powers. The present situation emphasizes the importance of petroleum resources in the world struggle now in progress and makes their control more vital than ever before.

George A. Hill, Jr., discussing "The Interstate Oil Compact as an Instrument of Democracy" said, "We must examine, and then re-examine recurrent assaults upon our American fundamentals, to safeguard the liberties we now possess lest we lose them in the mere preparation for their supposedly better defense.

"We should be supremely wary, as an industry, of yielding to the opportunist temptation (spoon-fed out of the syrupy cup of claimed emergent necessity) of surrendering an existing democratic process, such as the Interstate Oil Compact Commission, for a dictatorial and authoritarian federal control, in order to insure our later and ultimate resumption of the democratic process when and if an eager federal bureaucracy wearies of the exercises of plenary power.

"Is then, the Interstate Oil Compact Commission a worthy instrument and do its achievements entitle it to continued life as a public servitor?"

Hill reviewed the origin of the Interstate Oil Compact and outlined its purposes by quotations from the compact act. Listing the personnel of the commission, he indicated that its function was to reason and persuade, not to coerce or compel.

In concluding Hill said, "I earnestly renew again to all the oil-producing states, and especially the statesmen of Louisiana, the invitation to become members of the Interstate Compact Commission. There can be no infringement of your sovereignty. Only the compulsion of your own judgment can enforce its recommendations. You can help to make it function more successfully; it may be of inestimable value to you at a time when the democratic structure of our government is imperiled from without and within. This body may enable the miracle performance of the catalyst in bringing into existence a new vehicle of liberty and local self-government coordinated with national welfare. It may avert the catastrophe of centralized regimentation of federal oil control."

B. W. Hardey, Louisiana Commissioner of Conservation, substituted for Governor Sam H. Jones of Louisiana and welcomed the meeting to Louisiana. He briefly described reorganization of Louisiana oil control with establishment of a department of minerals as a separate unit, declaring that since inception of the new department the state has saved the industry $18,000,000, or twice the tax money paid to the state in the past two years, by preventing unnecessary drilling.

Hardey advised oil men to unite and clean house thoroughly through interstate compacts and similar means, and then to stand together to ward off regimentation and possible usurpation of control.

W. J. Holloway, former governor of Oklahoma, briefly discussed work of the Interstate Oil Compact Commission.

Papers at the three technical sessions

E. P. HAYES

New Officers Named For Southwest A.P.I.

New officers of the Southwest district, American Petroleum Institute Division of Production elected at Shreveport, March 28, include:

Chairman: E. P. Hayes, The Texas Company, Houston.

Vice Chairman for East Texas: E. B. Miller, Tide Water Associated Oil Company, Kilgore.

Vice Chairman for Southwest Texas: Matson Nixon, Southern Minerals Corporation, Corpus Christi.

Vice Chairman for North Louisiana and Arkansas: John P. Trimble, Bailey & Trimble, El Dorado.

Vice Chairman for Texas Gulf Coast: S. E. Buckley, Humble Oil & Refining Company, Houston.

Vice Chairman for New Mexico: D. A. Jordan, The Atlantic Refining Company, Odessa, Texas.

Vice Chairman for North and West Texas: W. H. Collins, Shell Oil Company, Wichita Falls.

Vice Chairman for South Louisiana: J. H. Rambin, The Texas Company, New Orleans.

Secretary-Treasurer: R. H. McLemore, Sun Oil Company, Dallas.

were grouped to present balanced programs at each session, with the Thursday afternoon meeting the only one to deal with a single subject, cycling.

Abstracts of papers follow:

The Removal of Paraffin by Electrical Heating from Producing Wells in the Texas Panhandle

By Benton Turner
and
Chas. R. Rider
Drilling and Exploration Company, Inc., Los Angeles, California and Dallas, Texas

Application of electric heaters to oil wells to raise the temperature of the oil sufficiently to put or keep the paraffin in solution has been attempted by several operators during the past 20 years, but the methods used to secure this result have been such that their use generally has not been adopted because of the expense involved.

Benton Turner

Basically the method supplies heat to melt the paraffin in the tubing by passing a direct current through the tubing and rods and using them as elements of a resistance heater.[1] The tubing is insulated from the tubing head and casing by special insulators. At a point in the well below which paraffin is known to form, contact is made between the tubing and casing to complete the circuit to the surface. Heat is generated in the tubing and rods rather than in the casing because the former have a smaller metal area and consequent higher resistance.

Current is supplied at the surface by a direct current, shunt-wound, high-amperage, low-voltage generator. Contact is made to the well head by means of removable cables, the tubing being used as the positive and the casing as the negative terminal.

Special equipment includes a tubing head insulator, tubing insulators, contactor, and generator. By electrical heating with a 70 K.W., D.C. generator, paraffn in an average Panhandle well can be returned to a fluid state in not less than 90 minutes' treating time. Cost of installing electrical heating equipment in a well will not in most cases exceed half the cost of a normal pulling and stripping job. In the Texas Panhandle it has not been necessary to heat the paraffn in the tubing to above 100° F. to be able to pump it from the well.

[1] "Paraffin Removed Economically by Electrical Process," Brad Mills, Oil Weekly, June 17, 1940.

Prevention of Corrosion of Steel Pipe Lines by Oil Well Brines

By William Stericker
Philadelphia Quartz Company

If it were possible to separate completely salt water from crude oil before the latter reached the surface of the ground, several problems of oil producers would be eliminated. Since salt water must be removed above ground and then discarded, corrosion of steel disposal pipe lines becomes a serious factor in oil production expense.

Wm. Stericker

Sodium silicate, known from laboratory experiments to be a practical inhibitor of corrosion by brines, was used experimentally in a pipe-line system which, at the end of four years of service was about ready for discard due to serious corrosion.

Addition of 100 gallons of silicate of soda in the proportion of 8.9 percent NaO_2 and 28.7 percent SiO_2 to each million gallons of salt water was suggested. When added to the brine without dilution, a precipitate was formed. If the silicate were diluted to 10 times its former volume with water before being added, precipitation was avoided. Actual addition was made by means of needle valves on the suction side of the pumps handling the brine.

Tests, on sections cut from the line for examination, showed that the cessation of the bluish-black color formerly carried by the brine resulted from the formation of a thin coating of light buff yellow silicate over the rust layer in the pipe.

Samples of the brine, although yielding results roughly paralleling those obtained from actual examination of pipe samples cut from the line, failed to follow closely the actual known values of silicate in the stream. This was found to be due to many factors in fluid movement, and to vary with the removal of corrosion products previously formed within the pipe.

After 235 days' operation, during which 1,262,000 barrels of salt water had been handled through the system and 24,500 pounds of silicate had been used, further check of the line was made.

As nearly as could be judged from observation the treatment was effectively preventing further corrosion. The black, flocculent material formerly carried had disappeared from the water and rendered it colorless and clear. Scale within the line, formerly soft and black, now was harder and more impervious. Reduction in the amount was estimated at about 25 percent. The thin, buff scale covered all earlier scale not removed from the pipe by the initial treatment.

The question of possible emulsion of crude oil in the brine was answered experimentally by examination of samples in a second installation. The high salt content of the brine being handled was found to offset the emulsifying ability of the silicate, and to prevent such action in the crude.

On high concentration brines, unless diluted in the ratio of 1:9, a hard gel is formed at the point of injection of the silicate. By assuring proper dilution, this action is inhibited, and no difficulty experienced in the precipitation of calcium and magnesium silicate in the lines nor in the treating and separating system.

Where brine is to be pumped into a disposal well, absence of precipitation and suspended matter is an advantage; for pit disposal such qualities are relatively of secondary importance compared to the formation of a protective coating within the pipe.

Practical Economics of Cycling

By B. B. Boatright and P. C. Dixon
Foran, Boatright & Dixon

In the event that a cycling project appears desirable after preliminary examination, a thorough evaluation is in order. The exact nature of the reservoir gas must be determined. Some distillates yield premium grade gasolines, and/or diesel fuels. Since most of the cost items of recovery are basic, a thorough investigation of the nature of the product to be produced should be made.

B. B. Boatright

From the strictly theoretical standpoint it is possible to completely develop a hypothetical unitized field of about 4000 acres and to cycle and recover its distillate reserve in a hypothetical 90 million foot plant with a maximum of 10 wells. Such fields probably will never exist, because, in the first place, this number of wells or more will be drilled to define the structure. This latter being the usual case, the operator considering a cycling project is confronted with the problem of designing a drainage pattern to make the best of previously drilled wells.

Wells for cycling may cost more than ordinary wells due to casing and coring costs. Every potential productive sand should be cored and every core recovered should be subjected to thorough testing.

The anticipated life of operations should make material difference in the quality and overall permanent nature of the plant. Selection of plant size is based largely upon relative economic returns. From a practical standpoint, anticipated life of operations should not be less than five years. For longer than five-year expectation provision should be made for full use of all installed facilities.

The purpose of this paper is to present in practical form a discussion of factors which, in the ultimate analysis, determine the probable degree of success and profit from a cycling enterprise. In order to coordinate the presentation of many divergent subjects it has been written as though directed to persons who seek a pattern about which they may intelligently attack the problem of inspecting and possibly developing a cycling project. An outline, or suggested procedure in developing a cycling project is appended to the original paper.

Testing of Gas to Determine the Feasibility of a Recycling Plant

By E. O. Buck
Gas Laboratories, Inc.

The newest industrial gas-field operation is termed "recycling." Wet gas is produced, the recoverable liquid hydrocarbons are extracted, and the processed gas is returned to the reservoir under approximately the original pressure conditions. This technique, although of recent development, has progressed to the point where some 555 million cubic feet of gas are recycled daily to recover some 14,000 barrels of condensate.

This discussion is concerned with the testing of gas to determine the feasibility, both from an operating and economic standpoint, of erecting a recycling plant.

This paper is carried in full, beginning on page 15, in this issue.

The Application of Electrical Models to the Study of Recycling Operations in Gas Distillate Fields

By Wm. Hurst and G. M. McCarty
Humble Oil & Refining Company

This paper presents the potentiometric method for determining the wave fronts swept out by dry gas in displacing wet gas from a reservoir in a recycling operation.

Wm. Hurst

Model analysis has achieved importance for the engineer in producing gas-distillate fields. The purpose of such studies is to obtain necessary data on the arrangement of input and producing wells which will give the greatest recovery of wet gas, as well as the essential curves showing the instantaneous and overall ratios of wet to total gas production that can be expected over the life of an operation. The latter information, in particular, offers the criterion for fixing the depreciation on the recycling plant equipment and gives the expected life of economic operation.

G. M. McCarty

In this paper the discussion is limited to two-dimensional analyses in gas recycling studies. If, however, in practice there is encountered wide variation in sand thickness and permeability, then some adjustment can be made with the potentiometric method to make a two-dimensional method approximate a three-dimensional one. The approximate effect of the variation in sand thickness on the size and shape of the dry gas pattern can be established by constructing the model so that the depth of the solution varies over the model in the same way that the sand thickness varies over the field.

In taking potentials, the entire depth of the solution is probed in order that an average of the various potentials be obtained. The variation in vertical permeability can be corrected by employing the dimensional analysis of the Laplace equation in interchanging vertical permeability with sand thickness to give a uniform permeability to the sand. This is expressed by the relationship that the vertical permeability is proportional to the sand thickness squared.

With reference to the mixing of the two gases at the interface where the wave front is advancing, it is the opinion of the authors that this effect is negligible in comparison with the discrepancies which can limit the ideal case when the sand ceases to be uniform. The reason for this is that mixing at the interface can occur either by turbulent action set up in the flow stream of the gas, or by a diffusion of one gas into the other at their interface, which is felt to be non-existing in the former and negligible in the latter.

Turbulent flow can only be realized where the gas velocities are high, and from a knowledge of the fluid velocities in a reservoir it can be said that the gas velocities away from a well bore are slow enough to be considerably below the critical value. Furthermore, diffusion of one gas into another is an extremely slow process. To offset these factors, however, it is known that the variation in sand characteristics is extremely important in the study of a recycling project. It is not inconceivable that sand irregularities can produce wave fronts whose interfaces do not comply with the ideal case of two-dimensional flow, but rather to a distortion which can be vertical as well as horizontal.

A Preliminary Survey of the Heaving Shale Problem

By H. H. Power
and
Chas. R. Houssiere, Jr.

Formations variously designated as "heaving shale," "sloughing shale," and "caving shale" impede and may even preclude drilling various areas, and particularly in certain parts of the Gulf Coast. Development of effective, dependable methods for drilling through these troublesome beds, it is believed, would comprise a major contribution to drilling technology and to the task of finding and discovering undiscovered oil pools.

The physical and chemical characteristics of these shales are described and the methods, both mechanical and chemical, which have been used up to the present for controlling troublesome beds encountered by the drill are summarized. Finally, a research program is suggested for a progressive examination of the more simple bentonites and the extension of procedures developed to more complex samples secured from wells experiencing trouble.

This paper appears in full, beginning on page 10, in this issue.

A Technique for Determining Optimum Spacing of Oil Wells

By Park J. Jones
Petroleum Engineer

Optimum economic enterprises depend primarily upon spacing of wells. For this reason the term "optimum spacing" is applied to the oil industry in the same sense that economists apply their phrase to any industry.

P. J. Jones

Optimum spacing is a problem the solution of which fixes the number of wells and the method, or combination of methods, of producing oil which can achieve the highest possible earnings on the reserves of an entire reservoir. Earnings are controlled by costs. In turn, costs depend primarily upon the number of wells drilled.

This paper presents a technique for determining optimum spacing by examples worked out in detail for arbitrarily assumed reserves, allowables and investments. The results apply only to the assumed conditions and are not intended to apply to any particular reservoir. The technique, however, is applicable to determinations of optimum spacing on all reservoirs irrespective of whether their fluid content is gas, oil, or condensate. The method also applies to individual wells and properties provided migration of oil is accounted for.

Optimum spacing for a given set of physical and economic factors is readily determined with the aid of appraisal tables. Optimum spacing of wells is readily ascertained in terms of costs and reserves. However, as the technique for estimating reserves is not systematized, it is suggested that future efforts be of a composite nature toward the establishment of the fundamental variables which control ultimate recoveries from all types of reservoirs. Because of the number of wells drilled, the going cost of capital recovery ranges from 200 percent up to 400 percent above what it would be if operators were protected under equity.

It is suggested that capital costs would be reduced if producers of oil could operate under equitable conditions as to allocation of allowables among fields in a given oil region. If equity were effective, capital costs and, therefore, spacing would differ very much from those which operators must now resort to in order to protect themselves under existing non-equitable conditions.

Energy Requirements for Pumping Oil Wells

By S. B. Sargent, Jr.
Sargent Engineering Corporation

This study is concerned with horsepower as the product of mass acceleration and velocity. The approach to the problem was through plotting data from a group of wells in various areas of the United States. Wells lying along peak performance curves were checked for pumping fluid levels, and on the basis of this information the curve determined as reasonable.

A theoretical basis for performance was sought and solution expected in evaluing the horsepower which any given string of sucker rods might transmit. Hydraulic horsepower required was determined, and work done by expanding gas subtracted. Utilization of this energy, being dependent upon the efficiency of the system, required some standard for this factor. From a probability curve from about 450 installations of gas lift a probable efficiency factor of 10 percent was derived, which seems in keeping with general opinion.

The determination of horsepower transmitted by a string of sucker rods is based on the conception of the work involved in deforming them and the number of times per second that this is done at a frequency equal to the natural period of the rods.

Using this assumption and choosing a maximum stress of 27,000 pounds per square inch, the horsepower transmitted by a sucker-rod string is analyzed in terms of initial force, work done in elongating rods, changing stress, and number of vibrations necessary to cover a distance equal to that of the theoretical pumping stroke. Equations are developed for each of these factors, from which, with given known quantities, mathematical analysis may be carried through to give results which, the author states in his conclusions, show very good agreement between the capacity of a string of sucker rods and the experimental data when the proper values for the various functions are substituted in the formula for the string in question.

Week's Operations Further Improve Statistical Position

Operations in the week ended February 22 further improved the statistical position of the industry, according to indices released by the American Petroleum Institute. All phases were favorable to better balance of supply and demand at present, and progress was made toward a position that will provide a safe base for the heavy refining season in prospect. Crude production and runs to stills declined, the latter sharply; crude and gasoline stocks increased moderately; gas oil and distillate, and residual fuel oil inventories were reduced by a small amount. The latter factor is only favorable if severe spring weather and industrial activity do not combine for a draft on fuel oils that will require unbalanced-yield refining to satisfy.

Crude production during the week ended February 22 was 3,629,650 barrels daily, down 9000 barrels from the daily average of the previous week, and 2.7 percent under the rate of production prevailing a year ago. This margin may be attributed to depletion in Illinois.

Runs to stills dropped to 3,590,000 barrels daily, off 40,000 barrels from the week proir. Successive decreases of the past three weeks have been 40,000 barrels, 10,000 barrels, and 40,000 barrels, bringing the latest average down to 1.1 percent in excess of the February, 1940, average. Crude oil stocks increased 698,000 barrels during the week of February 9, making an inventory at February 15 of 260,948,000 barrels, 9.0 percent over that of a year ago.

Gasoline production during the week ended February 22 was 11,744,000 barrels, 425,000 barrels less than the preceding week. Total finished and unfinished gasoline stocks was 95,812,000 barrels, up 1,071,000 barrels over the week before, but 1.4 percent less than a year ago. As a 96,000,000-barrel gasoline stock at March 1 was suggested as ideal by the United States Bureau of Mines in a December, 1940, publication, it appears that the present situation could not be improved upon in many respects.

Gas oil and distillate fuel stocks were reduced 1,377,000 barrels, the inventory of February 22 being 34,381,000 barrels, 37 percent above a year ago. Residual fuel oils stocks were cut 794,000 barrels, to 98,631,000 barrels, 4.3 percent below the inventory of a year ago. The 37 percent excess in lighter fuel oils will stand in good stead in prospect of heavy industrial demands through the summer, and is expected to be sufficient. The stock of heavier fuel oils should be higher in anticipation of demand, and at their present level constitute the most serious internal operating problem of the industry.

Trends of Operations and Changes in Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

WEEK ENDED	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1938:						
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
1939:						
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	[7]108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[5]1,690,800	3,475,000	246;982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[3]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
1940:						
January 27	3,611,600	3,470,000	237,339,000	87,914,000	27,407,000	103,015,000
February 24	3,732,100	3,490,000	240,836,000	96,719,000	25,390,000	103,419,000
March 30	3,841,250	3,585,000	250,561,000	101,370,000	23,778,000	105,081,000
April 20	3,858,550	3,535,000	254,881,000	[1]102,817,000	24,779,000	103,323,000
April 27	3,845,250	3,555,000	256,670,000	102,452,000	24,997,000	102,552,000
May 25	3,835,650	3,580,000	259,330,000	100,297,000	28,356,000	104,015,000
June 22	3,846,450	[1]3,690,000	260,891,000	97,276,000	32,751,000	104,683,000
June 29	3,639,550	3,625,000	262,059,000	95,142,000	33,590,000	104,486,000
July 27	3,690,400	3,555,000	262,579,000	90,173,000	38,981,000	105,924,000
August 31	3,501,350	3,575,000	265,865,000	85,393,000	44,766,000	108,774,000
September 28	3,799,950	3,600,000	263,609,000	82,273,000	47,986,000	108,450,000
October 26	3,640,300	3,565,000	262,746,000	80,891,000	[1]48,893,000	108,475,000
November 9	3,584,200	3,510,000	261,631,000	[6]79,847,000	48,408,000	107,687,000
November 30	3,335,050	3,510,000	262,679,000	80,284,000	46,212,000	106,618,000
December 28	3,385,500	3,585,000	261,552,000	83,274,000	42,266,000	102,620,000
1941:						
January 4	3,367,200	3,600,000	260,643,000	85,530,000	42,606,000	102,563,000
January 11	3,364,450	3,565,000	259,342,000	86,328,000	41,094,000	102,281,000
January 18	3,611,900	3,490,000	259,934,000	87,351,000	39,920,000	101,213,000
January 25	3,599,100	3,625,000	260,093,000	88,762,000	39,039,000	100,297,000
February 1	3,590,150	3,680,000	261,208,000	90,864,000	37,634,000	100,428,000
February 8	3,617,650	3,640,000	260,250,000	93,265,000	36,709,000	99,921,000
February 15	3,638,100	3,630,000	260,948,000	94,741,000	35,758,000	99,425,000
February 22, 1941	3,629,650	3,590,000	.....	95,812,000	34,381,000	98,631,000
February 22, 1940	3,732,100	[5]3,509,000	[4]239,510,000	97,215,000	25,096,000	103,061,000
Change in past year	—2.7%	+1.1%	+9.0%	—1.4%	+37.0%	—4.3%

[1] All time peak. [2] Peak for year. [3] Lowest since April, 1922. [4] Stocks, February 17, 1940.
[5] Lowest since October, 1922, due to shut down of six mid-continent states. [6] Lowest for year.
[7] Prior to April 29, 1939, data did not include stocks at terminals, in transit, etc., except in California.
[8] February, 1940, daily average.

Gasoline Market Strong; Crude Prices Unchanged

The gasoline market broke upward last week, with a brisk movement noted in every center along with scattered advances in quotations in instances where the general index price was unchanged. The demand for kerosene and some fuel oils was less, with a drop in quotations at New York Harbor. Lubes, natural gasoline, range oil and bunker fuel oil quotations were unchanged, as were crude oil prices.

Most Mid-Continent refiners continued to report brisk demand for gasoline in spite of slightly inclement weather. Quotations were unchanged. No changes in quotations for other products or open spot sales were reported. One Gulf Coast refiner reported that 80-octane gasoline was hard to find for a 4.75-cent bid, with other refiners offering that price for loadings prior to March 1, with the observation that the price would be higher after that date.

During the week, the Naval Bureau of Yards and Docks outlined a $5,000,000 gasoline storage program that embraces plans for over 35 separate storage assemblies for aviation and ordinary gasolines, with prices per unit ranging from $500,000 to $10,000. No estimate was given of the total expected capacity, but it should be sufficient to bulwark the gasoline market generally. The Army did not detail plans as announced by a House Defense Appropriations committee, the majority of its requests being for filling stations.

The New York harbor area displayed the only market softness pronounced enough to reflect in average quotations. Kerosene dropped ¼ cent on maximum, ⅛ cent on minimum to make the range 4⅞ to 5⅛ cents. Nos. 1 and 3 light fuel oils were down from ⅛ to ½ cent on maximum operation, with minimum dropping ⅛ cent in several instances. Only other change was also in New York harbor; bunker diesel oil dropping 5 cents per barrel, making the range $1.70-$1.75.

Coast Heavy Oil Producers Demand Higher Prices

Sharply increased demand for heavy fuel and diesel grade oils on the Pacific Coast, due primarily to increased industrial and maritime activity, brought forth demands from heavy oil producers for an upward revision in posted prices on those products. Last week, the San Joaquin Valley Oil Producers Association, representing a considerable proportion of the state's heavy oil producers, issued a statement asking an immediate upward adjustment in prices by purchasing companies.

Demands pointed out that the government's index for petroleum and its products has dropped so much that it is now only 49.3, whereas the price index on other commodities stands at 79.6. They asked an adjustment to price levels obtaining in January, 1940, of 70 cents a barrel at the well, an increase of 10 cents from present postings, pointing out that the present Los Angeles Harbor market price on fuel oil is 75

cents a barrel, as compared with postings of $1.35 a barrel on imported fuel oil in New York Harbor.

While heavy oil producers are demanding price increases, and in many instances threatening to shut in properties unless the value of their product is given recognition, statistics on the Pacific Coast situation would indicate that the supply of fuel in this area is substantially less than generally believed. On January 31, 1941, the American Petroleum Institute reported total stocks of fuel oil residuum in the Pacific Coast territory at 58,825,656 barrels, a decrease from a year ago of 7,164,733 barrels. For working stocks, the industry on the Pacific Coast needs an estimated 50,000,000 barrels of fuel, or, on the basis of withdrawals over the past year, the industry has on the Coast some 8,800,000 barrels excess supplies over actual working requirements. Furthermore, during January inventory withdrawals of fuel oil on the West Coast ran to more than 1,000,000 barrels.

With the continued expansion of industrial and transport activity due to the national defense program, some observers believe the drafts on California's fuel supplies will increase from month to month. The proration authority in the state now is seeking to revise the present uniform proration formula to permit a greater yield of heavy grade oils.

Those familiar with the California heavy oil stock situation point out that a large percentage of working stocks carried in the 50,000,000-barrel working stock figures are not useable due to the fact that they represent tank bottoms.

Wholesale Prices of Refined Products in Principal Markets

	Range Last week (Cents a gal.)		Changes from week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
60 Octane and under	3¾	4¼	...	...
63-66 Octane	4	4½	...	...
72-74 Octane	4⅜	5	...	...
Mid-Western Tank Car:				
60 Octane and under	3¾	4⅛	...	...
63-66 Octane	4	4½	...	...
72-74 Octane	4⅜	5	...	...
New York Harbor:				
68-70 Octane	5½	5½	...	...
72-74 Octane	5½	6⅞	...	...
Gulf Coast:				
60 Octane unleaded	4	4⅛	+⅛	+⅛
65 Octane unleaded	4	4¼	...	...
72-74 Octane leaded	4¼	5¼	+¼	+¼
NATURAL GASOLINE				
Grade 26-70:				
F.O.B. Group 3	2⅜	2⅜	...	...
F.O.B. Breckenridge, Tex.	2	2	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	4	4¼	...	...
42-44 water white	4¼	4⅜	...	...
Mid-Western Tank Car:				
41-43 water white	4⅛	4¼	...	...
42-44 water white	4¼	4⅜	...	...
New York Harbor	4⅞	5⅛	...	—¼
RANGE OIL				
At Oklahoma Refineries	3⅞	4⅛	...	...
In Mid-Western Market, Group 3, basis	3⅞	3⅞	...	...
LIGHT FUEL OILS				
Oklahoma Refineries:				
No. 1 straw	3⅜	3¾	...	...
No. 3	3¼	3⅜	...	...
Mid-Western Tank Car:				
No. 1 white	3⅞	4	...	...
No. 3	3¼	3½	...	...
New York Harbor:				
No. 1	4⅞	5⅛	...	—¼
No. 3	4¼	4⅜	—⅛	—⅛

	Range Last week (Per Bbl.)		Changes from week Before	
HEAVY FUEL OILS				
Oklahoma Refineries:				
No. 6	$0.65	$0.65	...	...
Mid-Western Tank Car:				
No. 5	.75	.85	...	...
No. 6	.55	.60	...	...
New York Harbor:				
No. 5	1.55	1.55	...	...
No. 6	1.25	1.25	...	...
BUNKER C FUEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$ .80	$ .85	...	...
New York Harbor	1.25	1.25	...	...
DIESEL OIL (Per barrel, ships bunkers)				
Gulf Coast	$1.40	$1.70	...	...
New York Harbor	1.70	1.75	—.05	...
Los Angeles Basin, 27 gravity	1.20	1.26	...	...
LUBRICATING OIL (Cents a gal.)				
Oklahoma Refineries:				
Bright Stock, 150-160 viscosity at 210°, 10-25 pour test	13	15½	...	...
Neutral oil, pale No. 3 color, 150 viscosity at 100°, 0-10 pour test	8	10¼	...	...
Western Pennsylvania:				
Bright Stock, 145-155 viscosity at 210°, 25 pour test	14	14½	...	...
Neutral Oil No. 3 color, 150 viscosity at 70°, 25 pour test	19	20	...	...

United States Crude Oil Production Continues to Decline

Estimates Compiled by The OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Feb.)	State Allowable (Barrels Daily in Feb.)	BARRELS DAILY FOR WEEK ENDED Feb. 22	Mar. 1
TEXAS—				
Texas Panhandle	.....	.....	76,000	67,800
North Texas	.....	.....	101,500	100,600
West Central Texas	.....	.....	29,950	29,900
West Texas	.....	.....	237,000	235,750
East Central Texas	.....	.....	71,800	72,850
East Texas Field	.....	.....	374,500	374,800
South Texas	.....	.....	205,200	205,500
Texas Gulf Coast	.....	.....	255,750	255,850
Total Texas	1,312,900	1,318,873*	1,351,700	1,343,050
CALIFORNIA—				
Long Beach	.....	.....	41,500	41,400
Midway-Sunset	.....	.....	45,600	39,000
Kettleman Hills	.....	.....	37,200	40,200
Wilmington	.....	.....	82,400	81,900
Others	.....	.....	406,000	383,200
Total California	595,700	571,000†	612,700	585,700
OKLAHOMA—				
Oklahoma City	.....	.....	88,500	93,700
Seminole Area	.....	.....	105,650	105,300
Others	.....	.....	212,550	212,125
Total Oklahoma	442,500	400,000	406,700	411,125
ILLINOIS—				
Salem	.....	.....	106,800	106,300
Louden	.....	.....	71,000	67,000
Centralia	.....	.....	13,400	13,300
Other New Pools	.....	.....	123,100	122,400
Old Pools	.....	.....	11,200	10,900
Total Illinois	342,100	.....	325,500	319,900

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (Feb.)	State Allowable (Barrels Daily in Feb.)	BARRELS DAILY FOR WEEK ENDED Feb. 22	Mar. 1
LOUISIANA—				
North Louisiana	.....	.....	69,300	70,000
South Louisiana	.....	.....	222,850	222,450
Total Louisiana	288,600	294,942	292,150	292,450
KANSAS	193,200	196,200	207,100	202,550
NEW MEXICO	100,700	106,000	100,750	103,700
EASTERN STATES—				
Pennsylvania Grade	50,000	.....	70,500	66,000
Others, Eastern	49,300	.....	23,200	27,000
Total Eastern States	99,300	.....	93,700	93,000
MOUNTAIN STATES—				
Wyoming	74,600	.....	73,900	74,000
Montana	20,000	.....	18,650	18,700
Colorado	3,900	.....	3,600	3,600
Total Mountain States	98,500	.....	96,150	96,300
MICHIGAN	47,500	40,000§	40,000	39,850
INDIANA	22,500	.....	20,300	21,000
ARKANSAS	66,100	69,969	70,300	70,350
MISSISSIPPI	16,100	.....	17,200	20,600
NEBRASKA	3,200	.....	3,400	2,900
‡Total 8 Prorated States	3,047,200	2,996,984	3,081,400	3,048,775
Total United States	3,628,900	.....	3,637,650	3,602,475

* Estimated net basic daily allowables as of February 1. Railroad Commission estimates that actual production normally is about 3 percent under allowable. But allowable normally increases as new wells are completed. Under February-March order, most Texas fields were ordered shut down February 1, 2, 8, 9, 15, 16, 22, 23 and 28; March 2, 8, 9, 15, 16, 22, 23, 29, 30 and 31. Texas Panhandle was ordered shut down February 2, 9, 15, 16, 23, and 28; March 2, 9, 15, 16, 23, 30 and 31.

† Recommendation of Conservation Committee of California Oil Producers.

§ Estimate of actual production under prescribed regulations, which do not fix a definite state total allowable.

‡ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Arkansas, Michigan.

CRUDE OIL PRICE SCHEDULES

Mid-Continent Gravity Scale Prices—Posted October 11-13, 1938, Except as Shown Under Headings

(Some fields of Mid-Continent have flat price postings, and are shown separately)

Gravity	[7]Okla.-Kans.	[10]North La.-Ark. 10-17-40	[9]Atlanta, Ark. 10-17-40	North & W. Central Tex.	East Central Tex.	Gray Co., Tex.	Carson, Hutchinson Co., Tex.	[1]Tomball, Tex. Type	West Tex.-New Mex.	[2]Gulf Coast (Tex.-La.) 10-2-39	[3]Some La. Gulf Areas 10-2-39	Jennings, La.	[4]Anahuac, Tex. Type 10-2-39	[5]Refugio, Tex. Type 10-2-39	[6]Mirando, Tex. Type 10-2-39	[8]Salt Creek, Wyo. (except Tensleep)
19–19.9	.....	.....	.....	.....	.....	.....	.....	.....	*$0.53	*$0.86	*$0.86	.....	*$0.81	*$0.91	*$0.86	.....
20–20.9	$0.60	.....	.....	.....	.....	.....	.....	.....	.55	.88	.88	.....	.83	.93	.88	$0.70
21–21.9	.63	.....	.....	.....	.....	.....	.....	.....	.57	.90	.90	.....	.85	.95	.90	.72
22–22.9	.66	.....	.....	.....	.....	.....	.....	*$0.95	.59	.92	.92	.....	.87	.97	.92	.74
23–23.9	.69	.....	.....	.....	*$0.78	.....	.....	.97	.61	.94	.94	.....	.89	.99	.94	.76
24–24.9	.72	*$0.73	*$0.63	*$0.71	.80	.....	.....	.99	.63	.96	.96	.....	.91	1.01	.96	.78
25–25.9	.75	.75	.65	.73	.82	.....	.....	1.01	.65	.98	.98	.....	.93	1.03	.98	.80
26–26.9	.78	.77	.67	.75	.84	.....	.....	1.03	.67	1.00	1.00	.....	.95	1.05	1.00	.82
27–27.9	.81	.79	.69	.77	.86	.....	.....	1.05	.69	1.02	1.02	.....	.97	1.07	1.02	.84
28–28.9	.84	.81	.71	.79	.88	*$0.72	*$0.67	1.07	.71	1.04	1.04	.....	.99	1.09	1.04	.86
29–29.9	.87	.83	.73	.81	.90	.74	.69	1.09	.73	1.06	1.06	.....	1.01	1.11	1.06	.88
30–30.9	.90	.85	.75	.83	.92	.76	.71	1.11	.75	1.08	1.08	.....	1.03	1.13	1.08	.90
31–31.9	.92	.87	.77	.85	.94	.78	.73	1.13	.77	1.10	1.10	*$0.87	1.05	1.15	1.10	.92
32–32.9	.94	.89	.79	.87	.96	.80	.75	1.15	.79	1.12	1.12	.89	1.07	1.17	1.12	.94
33–33.9	.96	.91	.81	.89	.98	.82	.77	1.17	.81	1.14	1.14	.91	1.09	1.19	1.14	.96
34–34.9	.98	.93	.83	.91	1.00	.84	.79	1.19	.83	1.16	†1.16	.93	1.11	1.21	1.16	.98
35–35.9	1.00	.94	.84	.93	1.02	.86	.81	1.21	.85	1.18	.....	.95	1.13	1.23	1.18	1.00
36–36.9	1.02	.95	.85	.95	1.04	.88	.83	1.23	.87	1.20	.....	.97	1.15	1.25	1.20	1.02
37–37.9	1.04	.96	.86	.97	1.06	.90	.85	1.25	.89	1.22	.....	.99	1.17	1.27	1.22	1.04
38–38.9	1.06	.97	.87	.99	1.08	.92	.87	1.27	.91	1.24	.....	1.01	1.19	1.29	1.24	1.06
39–39.9	1.08	.98	.88	1.01	1.10	.94	.89	1.29	.93	1.26	.....	1.03	1.21	1.31	1.26	1.08
40 & Up	1.10	.99	.89	1.03	1.12	.96	.91	1.31	.95	1.28	.....	1.05	1.23	1.33	1.28	1.10

* Minimum price and applies also to purchases of lower gravity.

† Maximum price and applies also to purchases of higher gravity.

[1] Tomball, Raccoon Bend (Deep) and Satsuma.

[2] Includes Amelia, Barbers Hill, Big Creek, Blue Ridge, Clear Lake, Cotton Lake, Esperson, Fannett, Goose Creek, Hankamer, Lovells Lake, Lochridge, Moore, Mykawa, Nome, Orange, South Liberty, Spindle Top, Sugar Land, Thompsons, Webster, Hastings, South Houston and West Beaumont.

[3] Includes Berwick Bay, Bay St. Elaine, Caillou Island, Chacahoula, Dog Lake, Edgerly, Four Isle, Gillis, Grand Bay, Hackberry, Horseshoe Bayou, Iberia, Jefferson Island, Lake Barre, Lake Pelto, Leesville, Port Barre, Starks, Timbalier Bay, Quarantine Bay, and Vinton fields.

[4] Anahuac, Dickinson, Gillock, Cedar Point, Fairbanks, Turtle Bay, Hull, Orange, Pierce Junction, Batson, Caplen, Humble, North Dayton, Saratoga, Sour Lake, South Esperson, Spindle Top, West Orange, Thompson (deep), and Raccoon Bend (shallow) fields.

[5] Includes Saxet, E. White Point, Greta, O'Connor, McFadden, Taft, Plymouth and Tom O'Connor fields.

[6] Includes Duval, Jim Hogg, Webb and Zapata counties, Texas, and Heyser and Placedo fields.

[7] Oklahoma Pipe Line and Magnolia schedules.

[8] Includes La Barge, Midway Dome, Dutton.

[9] Also Buckner, Magnolia, Schuler (Jones Sand), Village.

[10] Add 10 cents for Bunkie, Eola, Olla.

Mid-Continent Flat Prices

	Flat Price	Date Posted
Arkansas:		
Big Creek, Dorcheat, McKamie	$0.95	10–17–40
Smackover, Heavy	.73	10–12–38
Louisiana:		
Cotton Valley	1.10	10–17–40
Garden Island	1.24	10–12–38
Gibson	1.04	10–11–38
Lafitte	1.04	10–12–38
Rodessa, Shreveport	1.05	10–17–40
Texas:		
Cayuga	.78	10– 2–39
East Texas	1.10	10–12–38
Talco	.65	10– 2–39
Livingston, Cleveland	1.10	10–12–38
Van	.93	10–12–38
Pettus	1.29	10–12–38
Pecos County	.78	10–12–38
Pecos Shallow	.65	10–12–38
Luling	.87	10–12–38
Lytton Springs	.99	10–12–38
Salt Flat, Darst Creek, Hilbig, Carroll, Clark and Zoboroski	.96	10–11–38
Flour Bluff-Jim Wells Co.	1.23	10–11–38
Guerra	1.06½	5– 8–39
Seabreeze, Willow Slough, La Belle, Hardin, S. China	1.10	9–14–39
Clay Creek	.85	10–13–38
Conroe	1.27	10–11–38
Long Lake	1.08	10–19–38

Middle West Prices

Lima, Ohio	$0.90	10–13–38
Illinois, old fields	1.00	8–23–40
Illinois Basin	1.15	8–21–40
Lake Centralia-Salem, Illinois	1.15	8–21–40
Princeton, Indiana	1.00	8–23–40
Sw. Ind.-Se. Ill.; N. Griffin, S. Griffin, Phillipstown, New Harmony, Storms, Iron	1.15	8–21–40
Western Kentucky	1.05	8–21–40
Birk City, Western Kentucky	1.05	8–21–40
Kentucky River, Eastern Ky.	1.20	8–21–40
Big Sandy River, Eastern Ky.	1.12	8–21–40

Michigan Prices

	Flat Price	Date Posted
Central (Basin):		
Porter, Greendale, Crystal, Wise, Midland, Vernon	$1.22	1– 2–41
Buckeye, Edenville, Bentley, Beaverton	1.20	1– 2–41
Freeman, Sherman, Redding	1.17	1– 2–41
Arenac, Ogemaw, W. Branch	1.02	1– 2–41
Southwest (Shallow):		
Allegan, Kent, Van Buren	1.23	1–16–41
Monroe Co.: Trenton line	1.17	1–16–41
Adams-Arenac	1.05	1– 2–41

Rocky Mountain States Prices

Colorado:		
Canon City, Ft. Collins, Wellington, Moffat and Florence	$ .90	10–11–38
Iles, Light	.98	10–11–38
Iles, Heavy	.92	10–11–38
Montana:		
Cat Creek	1.10	10–11–38
Cut Bank	1.00	1– 1–40
Sunburst	.80	1– 1–40
New Mexico:		
Artesia	.77	10–11–38
Hogback	1.00	10–11–38
Wyoming:		
Big Muddy	.98	10–11–38
Byron	.55	10–11–38
Dry Creek	.92	10–11–38
Elk Basin	.90	10–11–38
Frannie, Light	.55	10–11–38
Frannie, Heavy	.42	10–11–38
Garland	.50	10–11–38
Grass Creek, Light	.90	10–11–38
Grass Creek, Heavy	.40	10–11–38
Hamilton Dome	.35	10–11–38
Lance Creek	.77	10–11–38
Mill Creek	.72	10–11–38
Oregon Basin	.40	4–20–40
Osage	1.30	10–11–38
Poison Spider	.59	10–11–38
Rock Creek	1.00	10–11–38
Tensleep	.646	10–11–38

Crude Production Taxes

In all states other than Texas, levies are severance taxes, collected in lieu of all other taxes, with exception of small special assessments made in Louisiana and Oklahoma, as shown below.

In Texas, any political subdivision as well as the state has power to tax, and state itself levies special taxes in addition to gross production tax, as shown below.

Arkansas—2.6 percent of gross market value.

California—.66443 mills per barrel of oil produced and 17.39 cents an acre on proved lands.

Louisiana—From 4 to 11 cents a barrel, depending upon gravity, average being 7⅛ to 8 cents; in addition, special taxes may be levied on well equipment, bringing total tax to average around 8⅝ cents a barrel.

Montana—Two percent of gross value at well and ⅝ of 1c per barrel.

New Mexico—Severance tax of 2 percent on oil and gas.

Oklahoma—Five percent of gross value less royalty interests; in addition, surplus warehouse stocks may be taxed by counties.

Texas—Gross production tax is 2⅝ cents a barrel or 2⅝ percent, whichever is higher, and averaged 2.94 cents in 1939. In that year, total tax on average barrel produced was, however, 9.23 cents, having included following levies: gross receipts 0.14 cents, regulatory 0.19 cents, state ad valorem 0.98 cents, other state taxes 0.62 cents, and local ad valorem 4.30 cents.

Wyoming—Production tax based upon state and county assessments.

Eastern States Prices

	Flat Price	Date Posted
Bradford-Allegany	$2.30	1–27–41
Sw. Pa. Pipe Line	1.95	1–27–41
Eureka Pipe Line, W. Va.	1.89	1–27–41
Corning Grade, Ohio	1.12	11– 4–39
Buckeye Crude, Ohio	1.55	7–12–40

Major Price Changes

	Penna. Grade	Mid-Cont. (36 Gr.)	Calif. (26 Gr.)
Sept. 6, 1933	Up 10	Up 10	Up 15
Sept. 8, 1933	.....	Up 15	.....
May 1, 1934	Up 10	.....	.....
Nov. 6, 1934	Cut 25	.....	.....
Dec. 6, 1934	Cut 25	.....	.....
Jan. 4, 1935	Up 15	.....	.....
Feb. 4, 1935	Up 15	.....	.....
May 16, 1935	Cut 15	.....	.....
June 26, 1935	Cut 15	.....	.....
July 16, 1935	Cut 10	.....	.....
Aug. 29, 1935	.....	.....	Cut *1
Sept. 6, 1935	Up 5	.....	.....
Oct. 29, 1935	Up 15	.....	.....
Nov. 1, 1935	.....	.....	Up *28
Nov. 18, 1935	Up 15	.....	.....
Dec. 6, 1935	.....	.....	Up *9
Jan. 9, 1936	.....	Up 10	.....
Jan. 13, 1936	Up 15	.....	.....
Mar. 7, 1936	.....	.....	Up *18
Dec. 28, 1936	Up 12	.....	.....
Jan. 28, 1937	.....	Up 12	.....
Feb. 24, 1937	Up 10	.....	.....
June 7, 1937	Up 15	.....	.....
Sept. 1, 1937	Cut 22	.....	.....
Oct. 12, 1937	Cut 25	.....	.....
Dec. 1, 1937	Cut 15	.....	.....
Mar. 7, 1938	Cut 17	.....	.....
June 13, 1938	Cut 25	.....	.....
Sept. 1, 1938	Cut 12	.....	.....
Oct. 11, 1938	.....	Cut 20	.....
Jan. 21, 1939	Up 12	.....	.....
Feb. 2, 1939	Up 8	.....	.....
Mar. 6, 1939	Up 12	.....	.....
Oct. 6, 1939	Up 25	.....	.....
Nov. 1, 1939	Up 15	.....	.....
Dec. 1, 1939	Up 10	.....	.....
Jan. 1, 1940	Up 25	.....	.....
Feb. 1, 1940	.....	.....	Cut *7
May 22, 1940	Cut 25	.....	.....
June 18, 1940	Cut 25	.....	.....
July 12, 1940	Cut 25	.....	.....
Aug. 28, 1940	Cut 15	.....	.....
Nov. 12, 1940	Up 15	.....	.....
Dec. 17, 1940	Up 15	.....	.....
Jan. 27, 1941	Up 15	.....	.....

* Signal Hill 26 gravity.

Allowables

[*Continued from page 36*]

present receipts might be reduced materially.

Humble Oil & Refining Company asked for more low cold-test oil from Gulf Coast fields, and because of the peculiar situation of these fields, it appeared likely these increases would be obtained if the parity theory is applied there. However, there was one obvious answer to the requests for more oil, a price increase by the companies needing more oil, which many operators believed would bring them the necessary connections.

The commission is powerless to consider price, and it could not be discussed at the hearing, but there has been no move on the part of the companies needing more oil to raise the price.

Demand for Texas oil for March was up 14,500 barrels, according to the United States Bureau of Mines. This meant a daily average of 1,327,400 barrels. Nominations by purchasers totaled 1,684,694 barrels, an increase of 78,819 barrels above the February demand. For the week ending February 22, the commission reported a total net allowable of 1,330,138 barrels after shutdown deductions. The total scheduled allowable before shutdown deductions were made was 1,804,856 barrels.

Operators asked for increases which totaled more than 200,000 barrels. In only one field, Heyser, was a decrease requested by the purchasing company. Barnsdall Oil Company had reduced its nominations from 2500 to 2000 barrels, and Gulf Oil Corporation was said to have decreased its nominations by 3000 barrels.

Texas Commission Requires Filing of Well Status Report

The Texas Railroad Commission has issued an order requiring a well status report to determine the location of dead wells in Texas.

It provides that "every operator of oil wells in the fields and districts in Texas shall furnish, upon request by the commission through its chief supervisor, a detailed report setting forth on a form supplied by the commission, the following information:

"District, field and county, name and address of operator, name of lease, well number, the top of sand or producing horizon and the total depth of each well, the status of each well as to whether it is flowing, pumping, on air or gas lift, or dead, the current schedule allowable, the production of oil and water during the test, the percent of water, together with a statement as to whether or not the well is currently making its allowable."

The data on the production of each well required above is obtained by "actual individual well tests made in accordance with the provisions given below:

"All wells shall be produced during the test under the same operating conditions as exist when producing the current daily allowable from the well. No change may be made in the operating conditions during the 24-hour period preceding the test, nor during the duration of the test.

"Each operator shall keep on file for a period of six months after the well status report is filed, a complete record of all data observed while conducting the test required by the well status report. These data shall include the following information:

"The time, and date the test was started and the time and date the test was completed; the location and number of the tanks in which the well was tested; the opening and closing tank gauges, and at least two gauges taken during the test period; if the well is flowing, the size of the choke, tubing and casing pressure; if the well is pumping, the size of the working barrel, the length of stroke, the number of strokes per minute; if the well is on gas lift, the injection pressure and the amount of injection gas used during the test period. If the wells are not produced continuously, the tanks must be gauged each time the wells are shut in.

"If possible, the water production for wells producing water shall be determined by volumetric measurement in the separate tank into which the well is being produced. However, if it is impracticable to measure the water in this manner, then the water percentage may be determined either by measuring the water with a weir or positive displacement meter. In lieu of the above methods, when specifically permitted by the chief supervisor, the water percent may be determined by frequent shake-outs of samples collected at the well-head."

The proposed order also requires the well status reports to be mailed direct to the engineering department of the commission at Austin, by the person making such report.

CALIFORNIA CRUDE OIL PRICES

Posted effective February 1, 1940. All gravities above those quoted take highest price offered in that field.

Gravity	Wilmington	Signal Hill (Long Beach), El Segundo	Seal Beach	Huntington Beach	Inglewood	Playa del Rey	Olinda, Brea, Canon	Athens-Rosecrans	Elwood Terrace	Torrance	Richfield	Whittier, East Coyote (La Habra)	Montebello	West Coyote Hills	Santa Fe Springs	Newhall, McKittrick, Kern River, Round Mt., Kern Front	Greeley Canal	Coles Levee, Richfield Western	Mountain View	Elk Hills, Buena Vista Hills, Midway-Sunset, Lakeview Area	Lost Hills	Coalinga	Wheeler Ridge	Kettleman Hills
14-14.9	$0.60	$0.65	$0.64	$0.63	$0.64	$0.65	$0.61	....	....	$0.65	$0.61	$0.61	$0.62	$0.63	....	$0.60	....	....	....	$0.60	$0.60	$0.60	....	....
15-15.9	.60	.65	.64	.63	.64	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
16-16.9	.60	.65	.64	.63	.64	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
17-17.9	.62	.65	.64	.63	.68	.65	.61	....	....	.65	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
18-18.9	.64	.65	.64	.63	.71	.65	.65	....	....	.68	.61	.61	.62	.63	....	.60	....	....	....	.60	.60	.60	....	....
19-19.9	.69	.69	.64	.67	.75	.70	.69	....	....	.72	.61	.65	.62	.63	....	.60	....	....	$0.60	.64	.64	.61	$0.60	....
20-20.9	.73	.73	.64	.72	.79	.76	.74	....	....	.75	.65	.69	.62	.67	....	....	....	....	.60	.69	.69	.62	.60	....
21-21.9	.78	.78	.64	.76	.82	.81	.78	....	....	.79	.69	.73	.62	.72	$0.63	....	....	....	.64	.74	.74	.66	.60	....
22-22.9	.82	.82	.69	.81	.86	.86	.82	....	....	.82	.73	.77	.66	.76	.63	....	....	....	.68	.79	.78	.70	.63	....
23-23.9	.86	.86	.75	.85	.89	.92	.86	$0.71	....	.86	.78	.82	.71	.81	.67	....	....	....	.71	.84	.82	.74	.67	....
24-24.9	.90	.90	.80	.90	.93	.97	.90	.77	....	.89	.82	.86	.75	.85	.72	....	....	....	.75	.89	.86	.78	.71	....
25-25.9	.95	.95	.86	.94	.96	1.02	.95	.82	....	.93	.86	.90	.80	.89	.77	....	....	....	.79	.94	.90	.82	.75	....
26-26.9	.99	.99	.91	.99	1.00	1.08	.99	.88	....	.96	.90	.94	.84	.94	.82	....	....	....	.83	.99	.95	....	....	....
27-27.9	1.03	1.03	.97	1.03	1.04	F.O.B.	1.03	.94	....	1.00	.94	.98	.89	.98	.87	....	$0.83	$0.92	.87	1.04	.99	....	....	....
28-28.9	1.07	1.07	1.02	1.07	1.07	Pipe Line	1.07	.99	....	1.03	.98	....	.93	1.02	.91	....	.86	.96	.91	1.09	1.03	....	....	....
29-29.9	1.10	1.10	1.07	1.11	1.10	....	1.10	1.04	F.O.B. Ship	1.06	1.02	....	.98	1.06	.96	....	.90	.99	.95	1.14	1.07	....	....	....
30-30.9	1.14	1.14	1.12	1.15	1.14	....	1.14	1.09		1.09	....	....	1.02	1.10	1.01	....	.94	1.02	.99	1.19	1.11	....	....	....
31-31.9	....	....	....	....	1.17	....	1.17	1.14		....	....	....	1.07	1.14	1.05	....	.98	1.06	1.02	1.24	....	....	....	....
32-32.9	....	....	....	....	1.20	....	1.20	1.19		....	....	....	1.11	1.18	1.09	....	1.02	1.09	1.06	1.29	....	....	....	....
33-33.9	....	....	....	....	....	....	....	1.24	$1.21	....	....	....	1.15	1.22	1.14	....	1.06	1.13	1.10	1.34	....	....	....	$1.12
34-34.9	....	....	....	....	....	....	....	1.29	1.25	....	....	....	1.20	1.26	1.19	....	1.10	1.16	1.14	....	....	....	....	1.17
35-35.9	....	....	....	....	....	....	....	1.34	1.29	....	....	....	1.24	....	1.23	....	1.14	1.20	....	....	....	....	....	1.21
36-36.9	....	....	....	....	....	....	....	1.39	1.33	....	....	....	1.28	....	1.27	....	1.18	1.23	....	....	....	....	....	1.25
37-37.9	....	....	....	....	....	....	....	1.44	1.37	....	....	....	1.33	....	1.31	....	1.22	1.26	....	....	....	....	....	1.29
38-38.9	....	....	....	....	....	....	....	1.49	....	....	....	....	1.37	....	1.36	....	1.25	1.30	....	....	....	....	....	1.33
39-39.9	....	....	....	....	....	....	....	1.54	....	....	....	....	1.42	....	....	....	1.29	1.34	....	....	....	....	....	1.38
40-40.9	....	....	....	....	....	....	....	1.59	....	....	....	....	1.46	....	....	....	1.33	1.37	....	....	....	....	....	....
41-41.9	....	....	....	....	....	....	....	....	....	....	....	....	1.50	....	....	....	1.37	1.40	....	....	....	....	....	....
42-42.9	....	....	....	....	....	....	....	....	....	....	....	....	1.54	....	....	....	1.41	1.44	....	....	....	....	....	....
43-43.9	....	....	....	....	....	....	....	....	....	....	....	....	1.59	....	....	....	1.45	1.47	....	....	....	....	....	....
44-44.9	....	....	....	....	....	....	....	....	....	....	....	....	1.63	....	....	....	1.49	1.51	....	....	....	....	....	....
45-45.9	....	....	....	....	....	....	....	....	....	....	....	....	1.67	....	....	....	1.53	1.54	....	....	....	....	....	....
46-46.9	....	....	....	....	....	....	....	....	....	....	....	....	1.71	....	....	....	1.57	1.57	....	....	....	....	....	....
47-47.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.61	....	....	....	....	....	....	....
48-48.9	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	1.64	....	....	....	....	....	....	....

Legislation

[*Continued from page 35*]

Representatives of independent marketers are attempting to secure hearings on the Gillette divorce bills, but have been advised that the Senate Judiciary Committee will not consider any investigations until after the lend-lease legislation is disposed of. While it is expected that the committee will grant hearings, it is not believed that the legislation will make much progress this year in the face of the failure of the TNEC to make recommendations, and also the opposition of the National Defense Advisory Commission voiced last year, to any action which might lead to disorganization of the industry during the present emergency, with particular reference to divorce.

The commission's views were expressed during consideration by the Department of Justice of the oil suit which it later filed, and led to the dropping of a demand for disintegration in that case.

Blessing on Underground Storage

Initiation of the Navy's program for the development of underground storage facilities for oil was provided for this week by a $5,000,000 fund included in a supplemental Army-Navy supply bill passed by the House and sent to the Senate.

The fund was given the approval of the House appropriations committee after Navy department officials had warned this was but a small part of the construction planned to enable the storage of all fuel underground.

Appearing before the committee during hearings on the bill, Rear Admiral Ben Moreell, chief of the Bureau of Yards and Docks, explained that the Navy has set up a program for fuel storage underground for gasoline, fuel oil and Diesel oil, throughout most of the continental stations, and for the noncontinental stations. At present, he pointed out, all of the Navy's fuel with the exception of aviation gasoline is above ground at Panama, and construction is under way to provide extensive underground storage at Pearl Harbor and Puget Sound. All of the noncontinental air stations are equipped with underground gasoline storage.

Asked by Representative Louis Ludlow as to the depth of the underground storage, Admiral Moreell said "the fuel-oil storage at Pearl Harbor will be in vertical tunnels about 300 feet high and about 100 feet in diameter. In some places we cannot go too far underground because of water conditions. That depends on the locality.

"This is a small part of the project we have for putting all fuel underground," he added.

Georgia Pipe Line Bills Heard

Bills to give pipe line companies the right of eminent domain and authority to traverse public property received the blessing of Judiciary Committee No. 2 of the Georgia General Assembly last week after a heated three-hour hearing. The committee voted 35 to 30 to report the measure favorably. The vote was taken at a closed session following a public hearing. There was no argument or debate at the closed session, but several committee members demanded the right to file a minority report, charging the bills were "unjust, unfair, and inequitable."

Throughout the heated and often bitter debate during the hearing, the principal issued involved was national defense.

Spokesmen for Southeastern Pipe Line Company, which is constructing a line from Port St. Joe, Florida to Chattanooga, Tennessee, contended that immediate completion of the project is vital to the defense needs of the country. Railroad officials, in reply, quoted military officials to the effect that the Army and Navy are not particularly interested in the line. Answering the railroads, Marion Smith, attorney representing the pipe line, declared that military authorities are interested because the line would release tank steamers for use in the defense program. He estimated that 75 tankers would be released within 30 days if the project were allowed to go forward.

Smith quoted a letter from President Roosevelt that a pipe line in this area was being held up because of opposition from other carriers, contending that Southeastern Pipe Line Company's project was the one referred to by the president.

W. L. Stanley, public relations officer for Seaboard Airline Railway, maintained the President was referring to a line in the Atlantic coast area.

"President Roosevelt could not have been referring to this pipe line or else he was misinformed as to its location," Stanley asserted. He declared the pipe line is being promoted by two oil companies, the Pure Oil Company and Gulf Refining Company.

"The principal question before the Georgia General Assembly," he said, "is whether you are going to impair and destroy the railway system in order to satisfy the selfish interests of a group probably the most powerful in the world.

"Pipe lines cannot carry guns and transport ammunition," he said. "You've got to have your railroads to do that. And in order to function they must have all the business they can get."

The measures are scheduled to come before the House this week.

Tax Bills Before Texas House

The Texas House Committee on Revenue and Taxation last week held hearings in an attempt to write a tax bill which will raise between $10,000,000 and $15,000,000 more. The committeee has appointed a subcommittee, headed by Representative Jim Taylor, and it is expected that this subcommittee will report on March 5.

During the hearings, the committee heard discussed the Harris bill to provide for a tax of ¼-cent a gallon on the potential agsoline in each barrel of crude oil. Another bill would provide for one-cent per gallon tax on all gasoline processed in Texas. Bills were presented to fix a rate on gravity, and one plan was considered which would provide for a rate that would vary in proportion to the amount of oil produced from each well.

It was argued that some of the bills would damage the industry as present refining profits amount to only ⅛-cent per gallon on gasoline. Competing refineries outside Texas would have an advantage on each gallon of gasoline processed.

Owners of stripper wells appeared at hearings before the committee, and complained that the small profit which they make now would be eliminated entirely if an aditional tax was ordered.

The Mid-Continent Oil and Gas Association presented statistics to show that oil is now paying taxes totaling 9.23 cents on each barrel of crude produced.

Although a sales tax has been introduced in the House, it appeared that a majority of the membership is in favor of raising additional funds by means of taxes on business and natural resources. The Senate was still working on a bill by the Governor to appropriate $27,000,000 for Social Security taxes, but it was believed that the bill finally drafted by the House would provide for raising less than one-half of this amount.

Other Texas Measures

The House passed and sent to the Senate for concurrence a bill to provide that sweet gas can be used for the manufacture of carbon black when there is no other market for the gas, and when the plant can process as much as five pounds from each 1000 feet of gas.

Hearing has been set for Monday night, March 3, on a bill to create a new oil and gas commission. No hearings have been held on the bill in either house so far. Oil men have been coming to Austin for several weeks to discuss the measure with members of the legislature, but so far there has been no indication on crystallization of sentiment either for or against the measure.

The House Committee on Oil, Gas and Mining reported favorably a bill to provide for penitentiary sentences for those placing dead wells on the proration schedule.

Representative Bray introduced a bill which to forbid the Texas Railroad Commission to curtail production from any well below the limits set out in the marginal well statute. Its approval would mean that in East Texas the allowable for a well could not be cut below 20 barrels on any calendar day, regardless of the method used.

House Bill 533, by Representative Bundy of Wichita Falls, would rewrite completely the gasoline tax law to give the state comptroller better control of gasoline taxes and to improve enforcement of this statute. The bill, as drafted, was submitted to attorneys for several major oil companies before it was introduced last week.

Following a vote among its membership which indicated that 87 percent favor placing California in the Interstate Oil Compact, the California Oil & Gas Association voted to indorse such action.

Compulsory unitization of all Arkansas gas fields is called for in a bill pending before the state legislature providing for creation of the Ouachita Valley Authority. The project calls for the state to enter the business of electric power production through steam plants, which will use gas for fuel. The bill will be given a committee hearing March 3.

Change West Ranch Rules

The Texas Railroad Commission has revised its rules for the West Ranch field to provide for allocation of production on acreage and per well, with 50 percent allocated on each factor.

Illinois

Shallow Well Yields 369 Barrels on Initial Test

One of Illinois' best shallow-sand producers has been completed in a new Marion County field, east of Patoka, Gulf Refining Company's Hill 1, SW SW SW 26-4n-1e, which pumped 369 barrels of oil and two barrels of water in its initial 24-hour test from Cypress sand at 1354-67 feet. It was shot with 15 quarts, and total depth is 1369. It is the second producer in the new East Patoka field, and offsets the discovery, a 50-barrel natural pumper, completed several weeks ago.

The third Trenton test for the Centralia field, Clinton County, has been announced as Algona Oil Company's Marshall 1, Section 1-1n-1w, ½ mile west of the field's second Trenton producer, Allen Borton's Storer 1, a 25-barrel pumper. Marshall 1 is to be deepened from Devonian lime and will be closely watched as the field's Trenton development has been stalemated because of the scant production of the two completions in the formation. A 200- or 300-barrel well would assure a deepening boom.

In the Lake Centralia-Salem pool of Marion County, the field's third Trenton producer, Magnolia Petroleum Company's Shanafelt 34, flowed 140 barrels in 24 hours and was being prepared for 135-quart shot of nitro. It was bottomed slightly below 4600 feet. The company's Shanafelt 37, also in Section 29-2n-2e, flowed 28 barrels in seven hours and was to be given a 140-quart shot. A Trenton operation, Mitchell's Lee 5, Section 29-2n-2e, was to start drilling plug Thursday. Total depth was 4517 feet, and Trenton top was 4509 feet.

A Wabash County wildcat two miles northwest of Bellmont, Sam Yingling et al's Tranquary Brothers 1, NE NE NE 26-1s-14w, cemented casing to test 12 feet of McClosky lime at 2902-14 feet, which on a drill-stem test showed about 150 feet of oil and drilling mud. The site is two miles southwest of a dry hole recently completed by the same operators, Fisher 1, SW NW NW 18-1s-13w, which was abandoned at 2800 feet.

Mt. Carmel Outpost Coring

An outpost to the Mt. Carmel field, which now includes seven producers in the city itself, E. O. Olds' Parkinson 1, block 52, SE NE NW 29-1s-12w, a mile south of production, was coring for the Cypress. The field has three pays, Biehl and Cypress sands and McClosky lime.

A test a mile northwest of the Albion field, Edwards County, Morrison and Noah's Smith 1, NE SW SE 12-2s-10e, was drilling below 2300 feet after coring 19 feet of saturation in the Bridgeport sand, one of the pool's three productive formations, which showed 160 feet of fluid, half oil and half water, on a 10-minute drill-stem test.

A White County wildcat, southeast of Maunie, Ralph Halbert's E. P. Hubele 2, NE NW SW 7-6s-11e, set casing to test a Palestine sand show at 1998 feet. Hubele 1, 60 feet west of No. 2, was abandoned after finding the McClosky dry. In the county's South New Harmony field, Lewis Production Company's Morris 1, SW SE NW 21-5s-14w, set casing to the Aux Vases after finding the Waltersburg and Benoist dry. The Aux Vases zone has not been tested in the area.

Benedum-Trees closely watched wildcat in Johnson County, Cavitt 1, SW SW NW 24-11s-3e, near Vienna, was drilling in shale and dolomite Thursday at 3752 feet. It is to be carried to the Devonian and recently went through a hard lime section in which seven bits were used in drilling 13 feet.

It was reported casing would be set at Wakins' Rossler 1, W½ SW SE 25-1s-7e, a mile west of Fairfield, Wayne County, after the test made 27 barrels of oil on a 45-minute drill-stem test of McClosky lime. Total depth is 3332 feet. The test is an east offset to H. H. Weinert, Inc.'s Hannah 1, recently completed as a Rosiclare producer. Watkins venture was dry in the Rosiclare. If successfully completed, the test may spur development of town lots in Fairfield. Much of the city-owned acreage on the west side of the town already is under lease.

Three wildcat ventures are to be started within the next 90-days in Wayne County by large operators, all in areas far removed from production, including Massilon, Orel and Jasper Townships.

Ruwaldt's Oslager 1, Section 26-2s-1e, second producer in the new Woodlawn field of Jefferson County, pumped 54 barrels of oil and 28 barrels of water in its second 24-hour test from Benoist sand at about 2000 feet. In its first 24 hours, the test pumped 106 barrels of oil and 40 barrels of water.

Newest producer in the Mason field of Effingham County, Skeeles et al's Slone 1, NW 22-6n-5e, swabbed 50 barrels of oil in 12 hours from McClosky lime, and was being prepared for the pump.

A new producer was being completed in the Dahlgren field of northern Hamilton County, W. Earl Witt's L. H. Cage 1, NE SE NE 34-4s-5e, which was being cleaned out with oil in the hole, bottomed in McClosky lime. Offsetting the field's discovery well to the west, Hall and Jordan's Deerhake 1, SW NE NE 34-4s-5e, recovered 10 feet of saturation at 3333-43 feet and was waiting on cement.

In Fayette County, Allied Oil Company's Bonnell 1, NE NW NE 15-4n-1w, a wildcat, was abandoned through McClosky lime at 1745 feet. It was the second test in that immediate area drilled recently by the company, and was prompted by the encountering of two feet of saturated Benoist sand on the Russell farm, a short distance southeast. The Carter Oil Company abandoned a west outpost to the Loudon field, Jefferson Lilly 2, NE NE NE 17-8n-3e, at 1596 feet after several weeks of testing.

Indiana

Posey County Wildcat Among Week's New Starts

Gulf Refining Company set surface casing for A. Aldrich 1, C E½ SE SW 31-5s-14w, Posey County wildcat two miles east and across the Wabash River from Maunie, Illinois. Nearest production is three miles northeast, the South New Harmony pool of White County, Illinois.

Another Posey County wildcat, ¼-mile east of New Harmony, C. A. Lynch and Harry Lewis' New Harmony Realty Company 1, NW NW NW 6-5s-13w, was being abandoned. Hole was bottomed at 2953 feet, through the McClosky.

Also spudding was a Posey County test two miles west of Griffin, A. W. Cherry and Barron Kidd's Pocket Realty Company 1, NW NE NW 2-4s-14w, Gulf Refining Company farmout. Nearest production is ½-mile northwest on the Keck Heirs lease. However, due north ¼-mile is Joe Minton et al's L. P. Hill 1, a McClosky test of 1939 which for a time showed for a light producer.

A mile northeast of Griffin, Ed S. Holman's E. B. Mumford et al 1, SE NW NE 6-4s-13w, was testing McClosky pay at 2919-24 feet. Hole was bottomed at 2932 feet. This test is just northwest of Holmans' John and C. Oeth 1, still testing McClosky after third cement squeeze job in attempt to shut off water.

Continental Oil Company's Bozeman Land Company 28, SW SW NE 23-3s-14w, first Salem lime test in the two-year-old Griffin field of Gibson County, pumped about 1¾ barrels of oil, with water, after 5000 gallons of acid in break at 3445-66 feet. Rods and tubing were pulled, and hole was being swabbed, still making some water. Lower Salem break, at 3507-21 feet, proved noncommercial after 3000 gallons of acid, and hole was plugged back. Salem, topped at 3256 feet, carried six saturated breaks, all of which will be tested. Hole was bottomed at 3526 feet, and casing was set at 3506 feet.

In Sullivan County, 12 miles northeast of Sullivan, T. H. Drake's Mary Curry 1, C NE NW 11-9n-8w, was drilling at 200 feet with cable tools. It is a projected Devonian wildcat, inactive for several months after moving in materials.

In Pike County, Madison Township, five miles west of Petersburg, Murphy

Oil Company's Essie Stewart 9, C N½ SW NW 26-1n-9w, was being completed in the Bethel (Brown) sand at 1325-27 feet, a new and deeper pay for this old area. Hole filled with 300 feet of oil in one hour after two feet of pay had been penetrated. The area has been producing for several years from Tar Springs sand.

In Crawford County, Union Township, M. R. Lankford and Calvin Esarey, Mt. Carmel, Illinois, spudded Elisha Esarey 1, wildcat ½-mile east of the town of Sulphur.

Abandoned was a Knox County wildcat, two miles south of Bruceville, Amerlagene, Inc.'s Ida Moran 1, N½ Donation 75, 3n-9w.

Also abandoned, after several weeks' testing, was a Daviess County wildcat in Reeve Township, Newton Pipeline Company's Willis G. Brittain 1, NE NE SW 16-1n-5w, at 3250 feet. Starting at surface elevation of 505 feet, Trenton was topped at 3212 feet. Slight show of oil and water was reported at 3225-45 feet.

Also abandoned was Joe Shaw's W. W. Witherson 1, C NE NW 20-1s-11w, White River Township, Gibson County, four miles west of Patoka, at 1988 feet, through the McClosky. It was a west offset to an estimated 2,000,000-foot gas well completed several months ago in the Hardinsburg sand. Just north of the failure, Joe Shaw located Olive Coolidge 1, C S½ SW SE 17-1s-11w.

Oklahoma

Logan County Wildcat Shows For Large Wilcox-Sand Well

Sunray Oil Company, Continental Oil Company and Fain Drilling Company provided the state's most important strike in 1941 at Donoghue 1, C NW SE 7-17n-1w, 3½ miles west of Langston pool and northeast of Guthrie, Logan County. After drilling plug at 5445 feet and opened for 10 minutes to clean a water-loaded hole, the wildcat flowed in a steady oil stream up to the crown block for seven minutes with a four-inch stream to the slush pits. Flow is estimated by field men from 1500 to 5000 barrels daily and gas was estimated between 12,0000,000 and 15,000,000 feet. Oil is light green, amber color and tested 44-gravity. Shut-in well head pressure was in excess of 1200 pounds, and was increasing. Operators were installing three 500-barrel storage tanks and a separator.

The wildcat topped Second Wilcox sand at 5425 feet, and 7-inch casing was cemented at 5423 feet. Offset acreage is held by Sinclair Prairie Oil Company to the north, Continental Oil Company to the northeast and east, W. C. McBride to the west, and Transwestern Oil Company and Sinclair Prairie Oil Company to the south. Location is on a seismograph high. Interest in this wildcat boomed when a thin section, 14-foot Mississippi lime was encountered to structurally elevate the test. Continental Oil Company bought out E. W. Hamilton's interest in the well. Before drilling plugs, royalty under the wildcat sold for $800 per acre.

Magnolia Petroleum Company's McKoy Heirs 1, SWCc SE 16-5n-11e, wildcat eight miles east of Calvin pool, Hughes County, and three miles west of Stuart, showed for a gas discovery in Upper Cromwell sand. Drill-stem test at 5300-5405 feet recovered 4,500,000 feet of gas and after 12 minutes, shut-in pressure gauged 2200 pounds on casing. Pay was topped at 5373 feet, and hole carried to 7025 feet in dry Wilcox sand with plug set at 5760 feet. Previous drill-stem test open for one hour at 6882-6905 feet below Viola lime, topped at 6739 feet, recovered 30 feet of mud with no oil or gas. Tubing will be run for further testing.

Byars pool, McClain County, was staging a revival with plug-back work to Layton sand increasing. Patsy Oil Company's Bond (James) 1, NW NE NE 16-5n-3e, original Viola lime discovery well, plugged back from 3623 to 2635 feet and perforated casing in Layton at 2610-30 feet. It gauged 62 barrels of oil and 15 barrels of water through casing. Same operator's Caldwell 1, NE NW NE 16-5n-3e, plugged back from 3705 to 2800 feet to test, and Richardson 1, SE SW SE 9-5n-3e, ripped casing at plug back depth of 3310 feet to get water. Old total depth was 3652 feet. Simpson-Roodhouse Drilling Company's James 2, NE SW SE 9-5n-3e, was testing Trenton lime at 3320 feet, from old depth of 3660 feet.

Paul J. McIntyre et al's Brown 1, SW SE NE 14-9n-7e, two miles west of Bethel pool, Seminole County, topped sandy Dolomite at 4321 feet. First Wilcox sand at 4331 feet, and filled up with water at 4334-37 feet. Hunton lime will be perforated at 4075-4115 feet where a show of oil was encountered. Misener sand showed oil at 4047-50 feet, and Hunton lime was topped at 4050 feet.

Cowan Pool Defined

Cowan Pool, Okfuskee County, was defined at Pioneer Drilling Company's et al Hinkle 1, NE NW SE 5-11n-10e, plugged in dry Hunton lime at 3690 feet. North of production ½-mile from this three-well pool, The Texas Company staked location for Bingham 1, NEc SE 16-11n-10e, for a Hunton-lime test.

Alma Oil Company's Hill 2, SE NW SW 1-21n-5e, offset to East Pawnee pool discovery, topped Mississippi lime at 3137 feet and set pipe at 3234 feet. Chat formation was penetrated at 3331-45 feet. Discovery well is producing from Misener sand. Standard tools have been moved in to drill plugs.

Weldon A. Hall et al's Jackson 1-A, C N½ NE SE 14-7n-7e, between East Little River and Wewoka pools, Seminole County, pumped 40 barrels of oil in 24 hours from Booch sand, shot with 40 quarts at 3168-92 feet.

Francis Oil & Gas Company staked location for Watkins 1, SW SE SW 8-7n-17w, two miles north of Hobart pool, Kiowa County.

Magnolia Petroleum Company announced plans to develop its 9600-acre block in Dewey County for gas-distillate through construction of a $1,000,000 recycling plant. Fiekes 1, C SW SW 31-18n-14w, five miles northwest of Oakwood, was abandoned last July at 9475 feet when tools became stuck in hole. In the 9400-foot horizon, pressure was gauged at 2800 pounds with considerable gas showing.

Kansas

East Extension Provided Russell County Pool

Shell Oil Company extended Hall-Gurney pool, Russell County, ¾-mile east at Ruby 1, Wc NE 36-14-13w, which swabbed and flowed 174 barrels of oil and 33 barrels of basic sediment and water in 2¾ hours. Kansas City-Lansing lime, acidized with 6000 gallons, had been perforated at 2836-40 and 2848-57 feet. Arbuckle lime at 3120-3219 feet was unproductive, and hole was plugged back at 2901 feet. Anhydrite was topped at 605 feet, Ft. Riley at 1530 feet, Florence at 1625 feet, Topeka at 2505 feet, Lansing at 2815 feet, and Sooy sand at 3106 feet. Lansing zone showed fair porosity in cores.

Alf M. Landon and Faulkner et al's Shaeffer 1, C W½ NW SW 3-21-13w, three miles southwest of Hiss pool and 4½ miles north of Gates pool, Stafford County, drilled plugs in Arbuckle lime at 3536-3544 feet for a 100-foot oil fill-up. Operators will acid treat and test.

Four miles southwest of Garden City and three miles northeast of Holcomb gas pool, Finney County, Kansas Power and Light Company opened a new gas pool with Spratt 1, C 31-24-33w, completed for 7,500,000 feet. Pay is Fort Riley, penetrated to 2763 feet and acidized with 14,570 gallons.

R. W. Shields completed the Penokee pool discovery at Paxson 1, NEc 11-8-24w, Graham County, pumping 200 barrels of 43.2-gravity oil in 24 hours. Lansing lime at 3750-56 feet was perforated with 33 shots, and treated with 500 gallons of acid. Hole was carried to 4104 feet in Arbuckle lime, and plug set at 3781 feet. Lansing was topped at 3558 feet.

Gorham pool, Russell County, was extended ¼-mile southwest at Haynes and Anschultz et al's Ball 1, SE NE NW 16-14-15w, which flowed and pumped 2179 barrels in 24 hours. Topeka lime at 2750-94 feet was acidized with 4000 gallons.

Carl Lebsack staked location for Sledd 1, C S½ NW 34-19-9w, outpost for the Campbell area of Chase pool, Rice County.

I. W. Murfin et al's Klussner 1, SW SE 27-15-12w, Dubuque area of Russell County, was drilling below surface pipe.

Stanolind Oil & Gas Company had rig at Nagel 1, C E½ NE SW 3-24-15w, nine miles west of Rattlesnake pool, Stafford County. Helmerich & Payne had location for Wondra 1, SW SE NW 10-17-12w, between Wondra and Odin pools, Barton County.

McPherson Drilling Company started two wildcats in the Severv area of Elk County. Clogson 1, SW SE SE 21-28-11e, was drilling below 300 feet, and Bateman 1, SW SE NW 24-28-11e, three miles east of production, was below 350 feet.

Gulf Oil Corporation plugged Boller 1, C E½ SE SE 29-7-22w, eight miles east of Penokee pool, Graham County, at 3890 feet in Arbuckle lime, topped at 3837 feet.

Schultz et al's Davis 1, C S½ SW NW 28-18-18e, 12 miles south of Pomona gas pool, Franklin County, was plugged at 1260 feet in Burgess sand.

Forest City Basin

Furnas County Test High On Granite, Abandoned

Barnsdall Oil Company and Helmerich and Payne's Erickson 1, SWc 8-1n-23w, wildcat near Beaver City, Furnas County, Nebraska, just across the Norton County, Kansas state line, encountered Granite high at 3488 feet, and was abandoned at 3492 feet. Fort Hays was based at 510 feet, Dakota topped at 870 feet, Morrison 1380 feet, Permian 1660 feet, Anhydrite 1900 feet, base American lime 2810 feet, top Granite Wash at 3485 feet and Lansing-Kansas City lime at 3225 feet. Alluvium deposits on top soil in the area prohibits effective surface geology.

Indian Territory Illuminating Oil Company brought in the second producer for Shubert pool, Richardson County, at Schaible 1, C SW SW 29-3n-16e, offset to the discovery. After acidizing Hunton lime at 2474 feet with 1000 gallons, flow gauged 360 barrels in 24 hours through casing. It checked 10 feet higher structurally than the discovery.

The Ohio Oil Company completed the thirty-fifth producer for Nebraska in Falls City pool at Sandrock 6, SW NW NE SE 20-1n-16e, pumping 461 barrels in 24 hours with 6 percent water from Hunton lime at 2248-60 feet, treated with 1000 gallons of acid.

In Otoe County, Ingersoll et al abandoned Hooks 1, NEc SE 3-7n-14e, at 1500 feet.

In the Missouri sector of basin, E. V. Jackson and Fred Rust plugged Hays 1, C NE NE 22-66n-42w, 15 miles northwest of Rockport, Atchison County, at 2192 feet in Hunton lime, topped at 2092 feet. This wildcat logged Topeka lime at 277 feet, Mississippi lime 1546 feet, and Hunton lime at 2092 feet. Falls City pool lies directly south.

The Ohio Oil Company was nearing Hunton lime at Bahr 1, SE SW SE 7-1n-16e, extension test in Falls City area, making hole below 2200 feet.

Northeastern Kansas Activity

In Nemaha County, Kansas, A. C. Bumpus e al's Achten 1, C S½ SE NW 12-4s-14e, was shut down at 2077 feet in Mississippi lime, topped at 2070 feet.

Dan McLaughlin & Son et al's Thorp 1, C NE NE 27-10s-20e, four miles south of Oskaloosa pool, Leavenworth County, cemented 2165 feet of 5-inch casing to test a good show of gas in Arbuckle lime at 2164-87 feet. Hole is bottomed at 2209½ feet in Arbuckle lime, topped at 2163 feet. Oskaloosa pool is productive in both Bartlesville sand and Mississippi lime.

Caufield & Sullivan were rotating below 1500 feet at Ragan 1, SWc SE 19-10s-20e, southwest of Oskaloosa pool, Jefferson County. McCain & Sherrod et al's Green 1, SWc NW 9-11-19e, based Hertha at 775 feet, cemented 6-inch casing at 1388 feet, and was drilling below 1575 feet.

McCain, Sherrod et al's Doan 1, C E½ NW SE 34-12-22e, Leavenworth County wildcat, was shut down for orders in Wilcox sand at 1590-1695 feet with a small show of oil and water.

Meinholdt & Edwards et al's Stanley 1, NW NE NW 3-14-21e, Douglas County, Kansas, was shut down at 1121 feet in Mississippi lime, topped at 1075 feet.

McAlpine et al's Tyler 1, NE SW SW 4-3s-15e, Brown County wildcat, filled with water at 810-60 feet and was inactive at 1000 feet.

Olson & McCole et al's Anderson Estate 1, C N½ SW NW 1-8s-7e, six miles east of Garrison, Pottawatomie County, Kansas, quit at 1195 feet in Lansing lime, topped at 930 feet.

West Texas

Fifth Strawn Producer Looms In Griffin-Kadane Pool

Deep Oil Development Company et al's Griffin 1, NE SE SW Palo Pinto School Section 13, promises to become the fifth Strawn producer for the Griffin-Kadane pool, Northwestern Archer County, through having logged oil saturation at 4374-85 feet. It is between the discovery and the 2 east outpost wells, and occupies a normal structural position. Pipe was run last midweek to complete. Eph Griffin et al's Fee 1, NWc SW Section 14, became the second Strawn failure to the northeast of production, having abandoned at 4444 feet. Petroleum Producers Company et al's Lynch 1, mile northeast outpost previously listed as being dry in the Strawn, entered the Ellenberger at 4860 feet, and was drilling hard dolomite at 4980 feet.

Magnolia Petroleum Company's Hayter 1, southeast corner of TE&L Section 2415 and near shallow production in the Swastika district, Archer County, logged nominal oil saturation in Canyon lime at 3077-99 feet, and was coring at 3105 feet. It is due to continue to the Ellenberger.

Deep Oil Development Company and C. B. Christi's T. Moer 1-B, southwest corner of Section 21, Block 3 third test for the Scotland 1-well Strawn pool, proved dry in the projected pay at 4144-59 feet and the Bend series at 5356-5433 feet. The hole has been plugged back to test prospective oil zone in the Upper Strawn at 3679-3704 feet.

Walter Gant and Medders' Vogtsberger 1, ⅞-mile northeast of the Vogtsberger 2-well pool, flows 90-barrel head of oil every third day after 45-quart nitro shot in Basal Strawn at 4794-4807 feet.

Fargo Upholds Reputation

The Fargo pool, Northwestern Wilbarger County, continues to uphold its classification as the most important strike made in North Texas during 1940. Amerada Petroleum Corporation's A. J. Folley Unit 1, SW SW H&TC Section 36 and a south outpost, became the second flowing producer from the Basal Canyon, or intermediate pay, having gauged 75 barrels of 41.5-gravity oil natural through ½-inch choke on 3-hour test. Production is from casing perforations opposite saturation at 3986-99 feet after plugging back from Strawn at 4669 feet. The company's Harrell-Magnolia 1, NWc NE H&TC Section 37, was drilling broken pay at 4452 feet, having logged top of oil saturation at 4410 feet in Strawn, topped at 4380 feet, or level with the nearest producer. This outpost flowed oil in pits when tester was used at 3931-45 feet in Basal Canyon pay. The pool discoverer increased its operations to a total of 12 in starting drilling on Goodpasture 1-B, east offset to the northernmost producer, and Sears 1, NE SE NW H&TC Section 37. Recently authorized tests by Humble Oil & Refining Company and Anderson-Prichard Oil Corporation have been held back by inclement weather.

New Horizon at Benton-Holmes

New shallow horizon was given the Benton-Holmes multi-pay pool, Montague County, when United Producers Company and Continental Company's R. F. Custers 2-B, north offset to 3650-foot producer, flowed 81 barrels of 39-gravity oil on 3-hour gauge through ½-inch choke. Production is from casing perforations opposite sand, possibly Canyon, at 2282-90 feet after plugging back from granite at 3589-3612 feet. L. S. Flannery's R. L. McLaughlin 2, southwest corner of 75-acre tract, J. L. Graham Survey, is a north outpost.

Wildcatting in Montague County met with disappointments the past week. Tom Hunter et al's Barcus-Conoco 1, northeast corner of Block 79, Kaufman County School Lands, was awaiting orders at 4501 feet pending decision of nearby lease owners to help finance deepening to Ellenberger, or granite. Several nominal oil shows were recorded in the Strawn, and drill-stem test at 4339-51 feet yielded 30 feet of oil-cut mud. J. G. Hammond's Jester 1, Mallard geophysical prospect, abandoned in dry Mississippian lime at 7164-76 feet. Top of Bend and Barrett shale were called at 6282 feet and 6850 feet, respectively. W. B. Omohundro et al's Parr 1, 5 miles northeast of Ringgold production, developed an abundance of salt water on drill stem test at 5684-5710 feet in Bend, topped at 5675 feet, and was drilling at 5880 feet. The Bend marker is 68 feet low to the nearest producer and 25 feet low to Sinclair Prairie Oil Company's Hawkins 1, recent failure in Ellenberger at 5806-5910 feet. Gulf Oil Corporation's Worsham-Spring 4, only active test in the Ringgold pool, was coring dolomite at 6060 feet, having failed to indicate production in the two Bend conglomerate zones.

To Run Pipe

Adequate oil pay to justify running pipe for a production test was logged by L. T. Burns et al's Southerland 1, ¾-mile northeast outpost for the Burns-Browning pool, Clay County, in coring Strawn series at 4479-4504 feet. The test was drilling at 4830 feet, and is slated to go to the Ellenberger, or 5500 feet. Bridwell Oil Company's Myers 1, C. Thompson Survey and south of the Neb-tex abandoned producer, failed to produce in the 3400-foot Strawn, and was drilling at 4950 feet. Carlos Wagner et al's Thaxton 1, projected 7000-foot wildcat and 3 miles northeast of Henrietta, was drilling dry lime at 5945 feet in Bend, topped at 5919 feet. Shell Oil Company's Coleman 1-A, 11 miles south by east of Henrietta, was drilling at 5320 feet. An outstanding producer among these prospects is needed to bolster interest in Clay County deep explorations.

North Texas

Abell Pool in Pecos County Extended Over Mile Northeast

Productive limits of the Abell pool, northern Pecos County, were expanded 1½ miles north by east of the discovery and beyond an Ellenberger failure, when Magnolia Petroleum Company's Baldwin-State 1 flowed by heads from 5 feet of Simpson sand, topped at 5215 feet. This outpost occupies the highest structural position, having topped the Tulip Creek at 4910 feet, or 2518 feet subsea, being 50 feet higher than the discovery. The well flowed 31 barrels of 44.6-gravity pipe-line oil on last 7-hour gauge through open tubing, and will be deepened. It is ⅜ mile northeast of the company's McKee 1-A, the original deep test for the area which was abandoned in Ellenberger at 6102-6267 feet after showing promise of oil production in the Simpson series. The latter logged top of Tulip Creek at 4950 feet, or 2565 feet subsea.

Magnolia Petroleum Company authorized its fifth deep test for the area in making location for Gerety 1, SEc Lot 12, H&GN Section 23, Block 9, involving a north outpost. The company's Markey 1, ¼ mile northwest of the discovery, succeeded in washing sand cavings overlying lost string of tools, and was in line to recover junk late last week. This test flowed 80 barrels of oil from Simpson-sand pay at 5391-5405 feet, with an elevation of 2391 feet, before sanding up. Top of Tulip Creek was called at 5075 feet, or 116 feet low to the discovery. Sharp-State 1, 1¼ miles northwest of the discovery, resumed testing late last week after cementing 21-foot section of collapsible 5½-inch liner on bottom at 5473 feet. Possible oil production was indicated at 5465-70 feet, with water immedately below. The latter entered the Simpson at 4905 feet and Tulip Creek at 5170 feet, with an elevation of 2395 feet, being 147 feet and 207 feet, respectively, lower on these markers than the discovery.

Phillips Petroleum Company's Silverman 1, south offset to the discovery, was drilling at 3780 feet, and George Abell et al's Rixse 1, was drilling at 2200 feet. Stanolind Oil & Gas Company's Conry-Davis 1, 4 miles south of production and updip on the structure, logged top of anhydrite at 370 feet, and landed surface pipe at 505 feet.

Culbertson & Irwin's Heiner 1, C NE NE GC&SF Section 589, and south of the Pecos Valley shallow district, is listed as a completion, flowing 32 barrels of oil daily with the aid of flow valves. Production is from broken Ellenberger at 5390-5509 feet, having plugged back from 5665 feet. The formation was treated with 13,500 gallons of acid.

Gulf Oil Corporation's Waddell 17, Crane County wildcat and on a strike between the Sand Hills and Abell areas, was drilling Permian lime at 4930 feet. No shows have been recorded since testing wet gas at 4112-4227 feet. The company's University 1-F, projected Ellenberger test, was drilling lime at 9610 feet.

Roeser & Pendleton et al's Hayes 1, north offset to the discovery gasser of the Quito area, Ward County, is awaiting nitro shot after plugging back from 5397 feet to 5130 feet. Evidence of gas and oil stain was logged at intervals in coring the Delaware-sand section, topped at 5083 feet, with an elevation of 2746 feet. Drill-stem tests established the presence of water below 5300 feet, and possibly in the Upper Delaware.

Development of production from the Clear Fork horizon in the Embar area, southern Andrews County, attained promise when Phillips Petroleum Company's University-Andrews 1, 1¼ miles northeast of a small Permian gasser, tested 1,500,000 feet of gas after 2-stage treatment of broken lime at 5150-5510 feet with 2300 gallons of acid. The prospect is bottomed at 5741 feet, and will be deepened. The company's Cowden-Embar 2 found the Clear Fork barren in drilling to 5864 feet, and moved off rig.

Lease buying has been active for several weeks to the northeast of the Hockley County portion of the Slaughter field. Delta Drilling Company's Slaughter 3-A, northeast corner of Labor 21, League 41, is the most northeasterly test, and developed a maximum of 5,000,000 feet of gas daily, with oil flow rated at 5 barrels hourly, after using 11,000 gallons of acid at 4973 feet.

East Texas

Fault Condition Revealed In Hawkins Field

The presence of local faulting within the Hawkins field is revealed by the trio of tests nearing completion on Humble Oil & Refining Company's acreage between the discovery pumper and the four townsite producers. The company's Dagnell 1, southwest corner of 147-acre tract, and Bryan 1, a nearby test and in the northwest corner of 113-acre lease, both in Willis Parker Survey, occupy favorable structural positions, but undoubtedly establish a local fault. The latter logged Pecan chalk at 2985-3160 feet and Austin chalk at 4135-64 feet, with an elevation of 405 feet. Top of Woodbine series was called at 4229 feet, and coring was under way at 4300 feet. Dagnell 1 logged Pecan chalk at 3025-3160 feet, and Austin chalk at 3973-4053 feet, with an elevation of 401 feet. The Woodbine series was entered at 4389 feet by log, being 164 feet low on this marker when correlated with the nearby operation, and was coring at 4450 feet.

Expansion of the north portion of the producing area to the east is indicated by the structural position of Humble Oil & Refining Company's Williams 1, located on 182-acre lease and near west edge of the B. M. Hampton Survey. The outpost logged Pecan chalk at 3015-3120 feet, and Austin chalk at 4010-78 feet, with an elevation of 406 feet. Woodbine series was entered at 4225 feet, and gas-oil contact at 4480 feet. Favorable oil saturation was reported in coring to 4550 feet. It is about a mile west by south of a failure drilled earlier this year.

The recent granting of a group of permits in the Hawkins townsite as exceptions to the spacing rules has materially stimulated development. General American Oil Company spudded its first test, and rigged up for a second. Paul L. Miller et al's Faulk 1, located on 1½-acre lease, and Tex-Jersey Oil Company's Fee-McClenny 1, located on 82/100-acre site, were due to start drilling late last week.

Oil production from the Pettit lime was developed by a northwest outpost for the Chapel Hill field when Sun Oil Company and Shell Oil Company's Warren 1 flowed 10 barrels hourly natural through ¼-inch choke with 500 pounds working pressure on tubing. Production is from 155 casing perforations at 8182-8209 feet. Travis Peak sandstone, logged at 8230 feet with an elevation of 472 feet, proved dry. It is a mile west of the first oil completion from the Pettit and a half mile northwest of the area's single Paluxy-sand gas-distillate producer.

Sun Oil Company's Dickerson 1, Jas. Holden Survey, and a west outpost, was drilling at 8130 feet, having failed to indicate gas in the upper zones. It is structurally low, having logged top of Georgetown at 4570 feet, with an elevation of 494 feet.

Sun Oil Company's Henderson 1, projected Trinity test for the Ore City prospect, Upshur County, was drilling at 4940 feet, with the Paluxy zone due near this level. Top of Georgetown was called at 3792 feet or 3511 feet sub sea.

Request Dual Oil and Gas Production at Hawkins

Use of gas from the sub-Clarksville sand in the Hawkins field for oil operations was requested at a hearing before the Texas Railroad Commission last week. Hollandsworth Drilling Company asked permission to complete one of its wells as a dual producer, allowing oil to be produced through the tubing from the Woodbine, and gas through the casing from the sub-Clarksville. Representatives of the company said the gas would be used primarily for drilling operations in the field, and that ultimately it would be used for jetting wells producing from the Woodbine.

J. S. Hudnall, Tyler geologist appearing for the company, expressed an opinion that the sub-Clarksville is separated from the Woodbine by an impervious formation, the Eagle Ford shale, 200 feet thick in some cases. He believed there would be no intercommunication between the sub-Clarksville and the Woodbine.

E. A. Wendlandt, division geologist for Humble Oil & Refining Company at Tyler, expressed a contrary opinion, declaring it appears that the field is faulted and gas has been found in the Eagle Ford shale in at least one well. He feared any general plan to use gas from the sub-Clarksville might affect the Woodbine reservoir.

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Southwest Texas

Navidad Area Opened With Gas and Distillate Flow

Jackson County had its second producing area of 1941 opened as a gas and distillate well was made in W. Stewart Boyle, John G. Mayo and C. A. Wright's Ralph Terrell 1 in the Navidad area. The wildcat flowed several million cubic feet of gas and a spray of distillate through 9/64-inch choke under 1250 pounds working pressure after perforations had been made at 3768-93 feet. These perforations were squeezed and others will be made in a higher zone. Several sands likely will be tested in the section from the Catahoula to the Frio in an effort to secure oil production. Hole was drilled to 6025 feet, then was plugged back to 4010 feet where 5½-inch casing is set. The first sand tested is at 3784-3806 feet. Location is in the southeast corner of a 366.5-acre tract, William Murphy Survey, and is one mile east of the Navidad River, eight miles northwest of Edna. The operators have a 2000-acre block.

The Texas Company's Silliman 1, Section 3, and deep test in the Ganado field, is reported opening a new producing level for that Jackson County area. The test drilled to below 7700 feet and was plugged back, recovering 2000 feet of oil on a drill-stem test after perforations were made around 6475 feet. This would be the second pay in the field, the regular sand being at 5100 feet.

Pure Oil Company opened a deeper sand in the West Ganado field of Jackson County with a distillate producer in Jow Havran 1, S. Rogers Survey. It is bottomed at 6621 feet, casing set at 6062 feet. On a drill-stem test following the shooting of 50 perforations at 5995-6005 feet, the well flowed at the rate of 2,929,000 cubic feet of gas and a spray of 53.5-gravity distillate through ¼-inch chokes, top and bottom. The tool was open two hours, during which time pressures built up to 2000 pounds. It was being completed as the week closed.

The magnitude of the new LaWard field of Jackson County is exemplified in the second completion, ½ mile south of the original producer. Robbins 1 logged the pay at 5210-16 feet and flowed 309 barrels of clean oil per day through ¾-inch choke under a low gas/oil ratio.

Flour Bluff Blowout

Humble Oil & Refining Company encountered difficulties in its development of the East Flour Bluff submerged field in Laguna Madre, Nueces County. Flour Bluff-State 6-D, nearly one-half mile from shore, was burning after blowing out at 8570 feet. It was making an estimtaed 33,000,000 cubic feet of gas per day and spraying some distillate when it first went out of control. An effort will be made to kill the well by a directional hole.

Texas Conservative Oil Company has assured at least one mile south extension to the South Clara Driscoll field, Nueces County, in Huie 1, Section 127. It found 7 feet of sand in the 5200-foot zone and on drill-stem test recovered 125 feet of oil and mud with no pressure. Another test was being made in the 5600-foot pay.

The main drilling program in Nueces County at this time centers around the Stratton-Agua Dulce sector, where exploration is underway up the entire east flank of these structures. Many leases have changed hands and three outpost tests are active, and several more are contracted for the immediate future. At least five sands have been proven productive of oil on the flank of this distillate area.

Another distillate area in prominence is LaGloria which was extended 1½ miles northeast in Jim Wells County. LaGloria Operators Committee's Lafferty 1, NE La Gloria townsite, was at 6902 feet with 7-inch casing set at 6206 feet. It encountered gas and distillate sand at 5912-27 feet, 5980-90 feet, 6079-6105 feet and 6120-32 feet. It will be a dual sand completion.

Humble Oil & Refining Company is due to make a production test in its wildcat 2 miles northeast of Lamar in St. Charles Bay, Aransas County. Casing finally was set with cement plug at 8232 feet. A squeeze job was then made at 7854-56 feet and a new set will be shot for a production attempt.

Wilson County Wildcat Showing

Wilson County apparently had been added to the ranks of oil-producing counties late last week by J. S. Suttle et al's R. J. Huebinger 1, Survey 9, was

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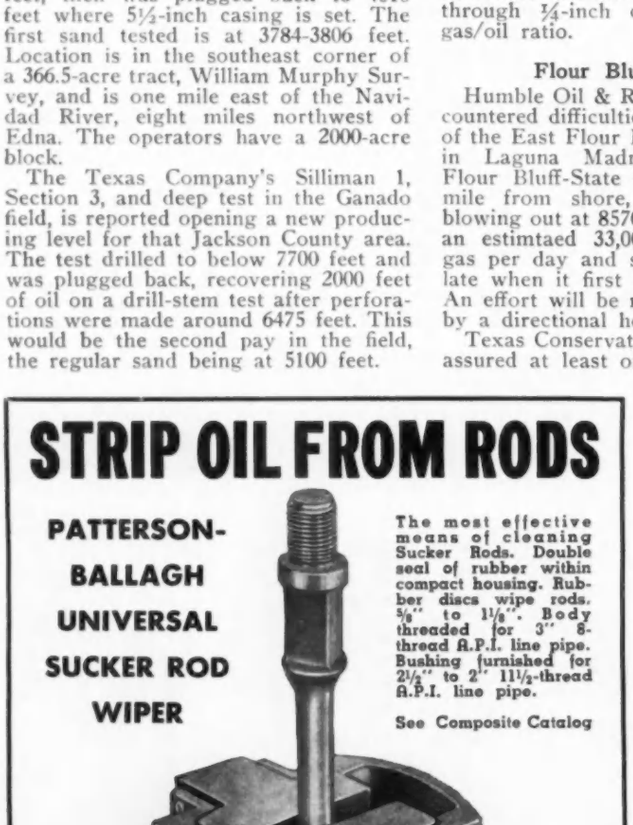

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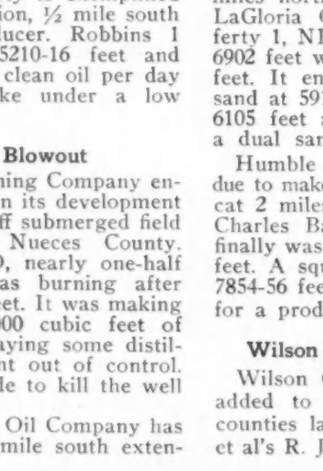

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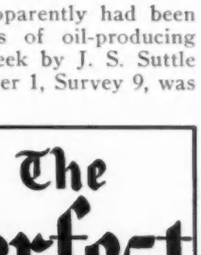

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testing considerable oil and drilling mud from 1801 feet. The test found sand and sandy shale in the base of the Navarro at 1714-1801 feet and casing was set atop that zone. The well will make a small pumping producer at the best, but likely will lead to considerable shallow development in the area. The wildcat is just southeast of Lavernia and is 16 miles east of San Antonio.

About 18 miles southwest of San Antonio and in Bexar County, L. A. Douglas' Trawalter 1, Section 10, Tejado Survey, was waiting on cement after a string of 5½-inch casing had been set at 1117 feet, atop the Anacacho lime. The well topped the Austin chalk at 1359 feet and is bottomed at 1366 feet. It had about 40 feet of saturation in the Anacacho zone and likely will make a producer after acidizing. The well is on a block of 1375.85 acres blocked by W. S. Hill and turned to Douglas.

Plan 12,000-Foot Hole

A test through the Wilcox section and deep into the Cretaceous zone is contemplated by Quintana Petroleum Corporation et al in J. L. Washburn 3, 3104 feet northwest of the Washburn field discovery in LaSalle County. The well likely will be carried to 12,000 feet. A string of 9⅝-inch casing will be set around 5500 feet. This is through all of the known producing zones in the Wilcox in the Washburn area.

Six miles to the south, William H. Spice's Reed 1 is logging the formation 92 feet lower than the Washburn discovery. It is coring below 5155 feet.

Another well to extreme depth will be Edwin M. Jones' West Estate 3-B, Section 56, on the George West prospect in Live Oak County. It was drilling below 8748 feet and had not reached the Wilcox zone. It will go to at least 10,000 feet.

Valley Fields Expanded

Several fields along the Rio Grande Valley trend were expanded with new Frio sand producers. These include the Kelsey, Rincon, Willamar and Samfordyce areas, ranging from 3900 to 7800 feet in depth.

Continental Oil Company's Davenport 1-D, 1½ miles south of Rincon field in Starr County, is flowing wash water and color of oil after perforations were made at 4000-20 feet. Sand was logged at 4000-26 feet and hole drilled to 4689 feet before being plugged back for completion.

Complete Oil Well Service Company's Garcia Land & Live Stock Company 1, on a Sun farmout and one mile northwest of Sullivan City, is a gas well estimated at 10,000,000 cubic feet per day through ⅜-inch choke under 850 pounds working pressure after perforations were made 3360-75 feet. The well had been shut down at 4306 feet. Located in Porcion 100, it may be an extension to the Samfordyce field or the discovery of a new area.

Sun Oil Company's E. Trevino 1-B, more than one mile southwest of the Kelsey field, recovered 450 feet of 47.6-gravity oil, 100 feet of oily mud, 5 feet of salt water and steady gas blow in 17 minutes when a test was run at 4744-55 feet. This is the regular Kelsey sand. Casing was set on bottom at 4764 feet for completion.

Texas Gulf Coast

Halls Bayou Test Provides District Third 1941 Field

A successful initial potential test definitely established Halls Bayou, Brazoria County, as the third field for 1941 in the upper Texas coastal sector. Strake Petroleum Corporation's Griffith 1, H. P. Cayce Survey, three miles southwest of the Alta Loma field, Galveston County, gauged 164 barrels of 49-gravity distillate daily through 5/32-inch choke, tubing pressure 2250 pounds, from open hole in Frio at 10,325-333 feet. The wildcat had assured production with a drill-stem recovery at rate of 486 barrels daily on 30-minute test. The completion was made under adverse circumstances, as the formation pressure was extremely high, requiring 15-pound mud and compounded pumps to control, and extreme caution in running casing, formation tester and tubing. Three new locations are expected within a week. Humble Oil & Refining Company, holder of 10,000 acres to the west, has not indicated drilling plans.

Superior Oil Company of California made the Lake Creek area of Montgomery County officially a distillate field, but not in the expected horizon. Tests of McWhorter 1, discovery, were concluded in the previously untouched Wilcox section at 9212-17 feet after obtaining 130 barrels of 61-gravity distillate in 15 hours through 12/64-inch choke, with 800,000 feet of gas, tubing pressure 1800 pounds. Salt water cut was 2 percent. The expected completion was in the 8930-35-foot section, which assured commercial production two weeks ago by flowing an estimated 180 barrels of 38-gravity oil daily. The wildcat found sands practically continuous in the Wilcox, topped at 8465 feet, with many showing partial saturation. There is a possibility that operator will elect to recomplete in the oil sand. The test is the second to the Wilcox in Montgomery County, its success placing the operators, Stanolind Oil & Gas Company, Amerada Petroleum Company and Sun Oil Company, in an advantageous position.

Humble Oil & Refining Company was opening the third distillate horizon, fifth productive level, for the Red Fish Reef field, seven miles south of Cedar Point, in Galveston Bay, Chambers County. State 8-A-223, a mile northwest of the discovery, flowed six barrels of 46-gravity distillate daily from 9307-12 feet on 3/16-inch choke. The well, one of the deepest to date, was drilled to 10,925 feet, tested at 10,760-780 feet to recover gas, plugged to 9353 feet, and tested 9367-72 feet, to flow three barrels of 47-gravity distillate hourly on ⅛-inch choke. The field now has pay sections at 8814, 9941, and 9307 feet, all distillate sections, and oil pays at 9941 and 10,990 feet. Gulf Oil Corporation failed to establish a new sand at 11,506-11 feet in State 1-R-224, north offset to the discovery, and was waiting on cement after squeezing perforations.

Sun Oil Company will attempt to confirm the Fig Ridge field, three miles north of Seabreeze, in Chambers County, with Meckelberg et al 1, D. L. Broussard Survey, 1036 feet north of the discovery, company's Smith 1. This strike was made in June, 1940, in Frio at 8841 feet, for a flow of 150 barrels of 32-gravity oil daily. Current test is first since discovery. Another 1940 discovery to receive delayed development is Lissie, Wharton County gas area, where Lon Cron, Cash & Reynolds staked McGill 1, A. Schwartz Survey, on 2000-acre block. Location is a mile south of Strake Petroleum Corporation's Strunk 1, 9500-foot dry hole. Discovery was made by Gulfboard Oil Corporation's Poole 1, which made 1,850,000 feet of gas daily, with 25 barrels of distillate, from Yegua at 6728-34 feet. Poole 1 was drilled by Strake Petroleum Corporation to 10,116 feet and sold to discoverers for tests of Yegua and Cook Mountain, which opened the field. Current test is projected to 7000 feet in Yegua, with Houston Oil Company of Texas, Sun Oil Company, Pan American Production Company, Atlantic Refining Company and Strake Petroleum Corporation contributing.

Pan American Production Company announced the first test on newly acquired acreage in the Gillock section of Dickinson field, Galveston County. Kohfeldt 1-F will be a 3500-foot northeast extension attempt in the J. Smith Survey. Company was building road to location. The test is the first of four which must be started at 90-day intervals, according to terms of purchase contract by which the company acquired 1774 acres from The Pure Oil Company and Texas Gulf Producing Company in December, 1940.

Franklin & Tideman were moving in rig for a Midway test in Burleson County, Haven Oil Company and F. T. Morrow's Lewis 1, in the Bennett League, seven miles northwest of the Clay Creek field. Operators have 5200 acres taken on surface and subsurface indications. A marine wildcat, Hall-Jordan's state 2-71, in the Gulf of Mexico, seven miles south of Sabine Pass, Jefferson County, took side-wall cores from several zones between 3425 and 3470 feet which showed an oil cut.

There was definite prospect that Texas Gulf Coast producing depth records may be broken within the next few months in the report that Glenn McCarthy was building road to Munson 1-A, on the Bailey's Prairie prospect, Brazoria County. McCarthy's Munson 1, Samuel Carter Survey, shattered drilled-depth records for the territory, bottoming at 11,870 feet, and for a time appeared to have set new producing depth record with a flow of distillate from 11,650 feet. However, potential was not taken, and the test has been standing shut-in. Existing record for the area is 11,427 feet, established by McCarthy at Chocolate Bayou, Brazoria County, early in 1940. This well, with considerable acreage, was sold to Phillips Petroleum Company, which now has a potential record breaker in Triangle Development Company 1, a mile east of Andrau 1. This test was coring near 11,600 feet toward original projected depth of 11,750 feet, but it is reported that it may be taken to 12,000 feet.

Ask Spacing Rule

O. W. Killam requested five-acre spacing for wells in the Killam field, Webb County, at a hearing before the Texas Railroad Commission last week. He asked that wells be spaced 220 feet from lease lines, and 440 feet apart, and estimated that the field would include 120 productive acres.

Louisiana Gulf Coast

Lakeside Prospect Again Gives Promise of New Field

The Lakeside prospect, Cameron Parish, was back in the spotlight as a probable oil field as Lisbon-Iberia Oil Company gauged Calcasieu National Bank 1-A, Section 19-12s-4w, for an estimated 92 barrels of distillate and 4,000,000 feet of gas daily through ⅛-inch choke, tubing pressure 3500 pounds. Perforations were at 9970-95 feet, upper section of the lowest of five promising sand zones indicated by electric log. Test was first made in the lower half of the section, recovering 210 barrels of 53-gravity distillate in 76 hours. After deepening to 10,685 feet, this section was retested and after difficulty with sanding, flowed only a small amount. Sands logged at 8730, 8220, 9518 and 9798 feet have not been tested. All sands show gas caps, with only one, that at 9518 feet, showing oil-water contact. Operator had not decided as to further testing before completion. The wildcat is the fourth on an old prospect of The Pure Oil Company, that company having drilled the previous three.

Final completion of Plymouth Oil Company's Tilly 1, Section 13-12s-10e, provided a second and deeper sand for the Bayou Pigeon field, Iberia Parish. Flow was 23 barrels of 47-gravity oil daily via 3/16-inch choke, tubing pressure 1050 pounds. Perforations were at 8142-53 feet, 100 feet below the discovery pay. Discovery was made in 1940 at 8052 feet. The company has two interesting operations in progress which will do much to determine the ultimate extent of the field. The tests are Schwing Lumber Company 1, Section 11-12s-10e, 1¾ miles northwest of the field, and Williams Cypress Company 1, Section 11-12s-10e, 3¼ miles southeast of production.

Rapid development will be the rule in the new St. Gabriel field, Iberville Parish. Titanic Oil Company made four locations, moving materials to Natalbany Lumber Company 2-A, 933 feet north of the discovery, company's Natalbany Lumber Company 1. Official potential on discovery was 238 barrels of 30.5-gravity oil daily via 9/64-inch choke, no water, with tubing and casing pressures 2350 and 2850 pounds. Perforations at 7766-76 feet were in the shallowest oil sand indicated by electrolog, the section being next after a 6875-foot gas and distillate sand, and over three deeper sands. Other locations are Gueymard 1-B, southwest offset to discovery, Gueymard 1-A, west offset, and Gueymard 1-C, 2000 feet southeast of the discovery. New locations and discovery are on Shell Oil Company farmout acreage.

Vermilion Parish Lease Play

An interesting lease play has developed around the Cheniere Au Tigre topographical feature in Vermilion Parish, Township 17s-2e, where The California Company selected entire geophysical block of 15,000 acres. Option was taken last year at 25 cents per acre. The high as indicated by the seismograph is a large structure similar to that at White Lake, centering under Section 2-17s-2e. The California Company block covers the apparent east half of the structure, while Louisiana Land & Exploration Company and Union Oil Company of California share a large part of the west section. A joint test is said to be impending. Other lease takers are Skelly Oil Company and Lyle Cummins.

South flank activity at Gueydan, Vermilion Parish, with objectives the new 9200- and 9700-foot sands, was well under way. Fohs Oil Company and The Pure Oil Company were prepared to spud tests, the former, Mulvey Irrigation Company 4, Section 34-11s-1w, 600 feet southeast of production on top of the dome; the latter Alliance Trust Company 7, west offset to Fohs Oil Company's Mulvey Irrigation Company Nos. 1 and 2, 3800-foot southwest extensions which found the new pays. Fohs Oil Company's Mulvey 3, 700 feet northeast of No. 2, was drilling near 7000 feet.

Wildcat activity was balanced with one new location and one failure. Hebert & Smith staked Evangeline Land & Minerals Company 1, Section 37-3s-1w, a 9500-foot test on the Pine Prairie prospect of Evangeline Parish, with C&I Drilling Company awarded the contract. Structure is a proven salt dome made an oil producer in 1912 by a 1300-foot cap rock well. Subsequently, Miocene at 2300 feet was made to produce, the field being abandoned in 1919 after producing 20,000 barrels. Deepest hole is 5916 feet. Leaseholders are Pan American Production Company, Gulf Oil Corporation, and Humble Oil & Refining Company.

Stanolind Oil & Gas Company abandoned Continental Land & Furs Company 1, Section 34-17s-14e, on the Lake Piquant prospect, Terrebonne Parish, at 11,010 feet, with no shows reported.

Louisiana Permits

Twenty-six drilling permits were authorized last week by the Louisiana Department of Minerals, of which nine were in North Louisiana divided among the following parishes: Caddo 1, Claiborne 1, DeSoto 1, LaSalle 3, Ouachita 1, Sabine 1, and Webster 1. The 17 in South Louisiana were in the following parishes: Acadia 2, Cameron 2, Evangeline 4, Iberville 1, Jefferson Davis 1, Lafourche 2, Plaquemines 2, St. Martion 2, and West Baton Rouge 1.

Ask 75,000-Barrel Boost For Wasson Pool

An increase of 75,000 barrels daily in the net allowable for wells producing in the Wasson pool, Gaines and Yoakum counties, was requested at a hearing before the Texas Railroad Commission last week. Although the hearing was held two days after the statewide hearing, permission was obtained to incorporate it with the statewide records, so that should an increase be justified, it could take effect as of March 1.

Amon G. Carter and M-B-K Drilling Company asked that a net allowable of 26 barrels per well be raised. Aloco Pipe Line Company and the Basin Pipe Line Company would buy the additional oil.

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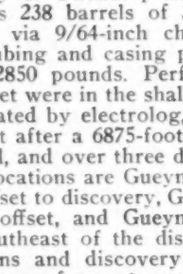

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North Louisiana

Olla Trend Wildcat Dry After Drilling 6725 Feet

Another northeast Louisiana wildcat, seeking production along the Olla trend adjacent to the Angelina-Caldwell Flexure, was abandoned. H. L. Hunt's Lancaster 1, SE SE 3-14n-12e, Madison Parish, drilled to 6725 feet, Electric log was run, but contact points were not announced. Hunt, discoverer of both the Olla and Nebo (Jena) fields in LaSalle Parish, has four other wildcat tests drilling in northeast Louisiana in this trend.

Three widely separated wildcat locations were made, all on this trend or a western prolongation of it. In LaSalle Parish, Big West Drilling Company located Whatley 1, NW NE NE 25-8n-2e; Natchitoches Parish, C. Porter Johnson located Sam Lacaze 1, SE 63-6n-4w (irregular section), near Colfax, and in Sabine Parish, Plummer & McDaniel made location for Phares 1, NW SW 4-5n-12w.

Indicative of a decline in drilling at Olla, LaSalle Parish, was a single completion during the week. The old shallow 1500-1600-foot chalk horizon in the old Pine Island field, Caddo Parish, has again taken the lead in drilling in North Louisiana, after having been displaced for several months by Olla. Pine Island added five producers and one failure last week.

Big West Drilling Company made location for a southeast edge test in the Lisbon field, Lincoln Parish, a section inactive for several months and so far drilling for Travis Peak or lower Marine production. The new location is T. F. Patton Estate 1, SE 7-20n-4w.

Union Producing Company prepared to perforate at several points between 10,148 and 10,382 feet in the Smackover lime at Meadows A-1, C NE 18-21n-4w, 2½ miles north of Lisbon production. This test drilled into Permian salt, setting a new depth record at 11,834 feet.

Delta Drilling Company prepared for distillate test at T. E. Dunn 1, NW SE 24-17n-16w, wildcat near Greenwood, Caddo Parish, that showed an estimated 10,000,000 feet of gas at 2459 feet several months ago. Separator and tanks have been installed.

Arkansas

Dorcheat Field Receives Its Tenth Oil Well

The Dorcheat field, producing oil and distillate from the Smackover lime, added its tenth producing well last week when Shell Oil Company completed W. P. Keith 2, SE SE 9-18-22, at 8882 feet flowing 15 barrels of oil per hour through 13/64-inch tubing choke, with casing pressure 2100 pounds and tubing pressure, 2900 pounds.

With the Magnolia field inactive and the Atlanta field defined in all directions save one, Dorcheat appears in line for the most activity of the four deep fields in Columbia County during the coming year. One test was drilling at Dorcheat, and it had another active location.

Atlanta's only operation, on the west edge of production, circulated mud preparatory to running casing for production test. It is G. Scott Hammonds' Goode 1, SE NW 16-18-19. Electric log showed top of Smackover at 8239 feet, porosity at 8246 feet, and total depth of 8297 feet (elevation 268 feet). Bottom of the hole from laboratory examination of a core indicated the water level.

Barnsdall Oil Company's Cornelius 1, SW NW 28-17-23, Lafayette County, at McKamie, set 5½ inch casing on bottom at 9362 feet, after electric log was run. Top of Smackover lime was 9172 feet (elevation 272 feet). McKamie is Arkansas' deepest field. Two other drilling operations in the field are by Atlantic Refining Company. One is below 8470 feet, and the other below 8140 feet. One other test there is rigging, and another was an active location.

The LaFayette side of the Buckner field accounted for the field's twenty-fourth oil well, and the second Buckner townsite producer.

Mississippi

Two Field Wells Are State's Sole Completions

Oil activity continued at a low ebb last week in Mississippi, only two new wells being added, both in the Tinsley Dome field, Yazoo County, which also accounted for three new locations.

On the north edge of Tinsley Dome production, Slick Urschel Oil Company's Slick 14, NE SW 35-11n-3w, was waiting on pumping unit after drilling to 6161 feet in the Tuscaloosa and setting 5½-inch casing at 6010 feet. With elevation of 208 feet, it logged top of chalk at 4727 feet, topped Woodruff sand at 4778 feet; topped Tuscaloosa at 5915 feet, and logged the "Powell" sand of the Tuscaloosa (Woodbine) at 6064-6618 feet.

On the northwest edge of production, Union Producing Company's J. G. Woodruff A-1, SW NW 11-10n-3w, ran formation tester with tool set at 4881 feet, and ⅜-inch choke at bottom and ¼-inch at the top, and recovered 250 feet of oil-cut mud and brackish water. Electric log was run, and 7-inch casing cemented at 4875 feet. Total depth is 4920 feet.

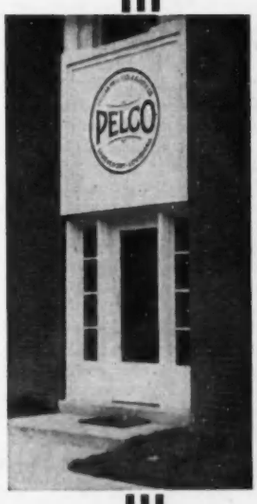
On the southwest edge of production at Tinsley Dome, Union Producing Company's V. M. Perry 1, SE SE 23-10n-3w, was completed at 4637 feet, flowing 250 barrels of oil in 12 hours through ⅜-inch tubing choke, with tubing pressure 50 pounds and casing pressure 110 pounds. Shake-out was 0.2 percent basic sediment. Elevation is 182 feet.

Clint Crosby's John F. Allen 1, SW SW 33-13n-5e, Attala County wildcat, was preparing to reperforate after squeezing off nine shots in casing at 4018-21 feet. This test topped chalk at 2969 feet.

Arkansas Fuel Oil Company was renewing leases in Clarke County, west Alabama, near Salitpa.

Consider Your WHISKERS

If the water's hot and the blade new, you probably shave your own face with very little bloodshed and not too much pain. But we wouldn't want you scraping us, because you wouldn't know which way the whiskers grow on our mug. Which goes to show that experience makes things easier. We know the territory we serve just like you know the whiskers on your own chin. So that with your knowledge of the oil business, and our experience with supplies and equipment in this area, we ought to get any job done with neatness and dispatch. We're ready when you are.



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California

Stake Wildcat in McClung Area of Kern County

In the McClung area of Kern County, Union Oil Company staked location for No. 31-3, Section 3-30-26. Location is west of a wildcat drilled in this area by Superior Oil Company in 1939, which was taken to 13,131 feet but failed to make a producer. Superior Oil Company encountered the Vedder at 11,126 feet, and the Avenal at 12,825 feet. Some gas was shown in the Vedder, but the Avenal tested wet.

Drilling a southwest outpost location in the Mount Poso field, Trico Oil & Gas Company's Coffee 5, Section 8-28-29, was completed flowing 240 barrels daily rate of 17-gravity oil and 1,000,000 feet of gas. It is the largest gas volume obtained in any well completed in this district in some time. Bottomed at 1286 feet, top of Vedder was placed at 1203 feet, and the Walker at 1260 feet.

Kern Line Oil Company's wildcat in Section 19-11-19, Grapevine-Tejon Ranch area of Kern County, bottomed at 8290 feet, recovered only a small amount of mud and water on formation test after shooting with nitro-glycerine. Operator plans to continue drilling.

Union Oil Company's deep test at 25 Street and Rose Avenue, in the Long Beach field, was drilled to 10,894 feet, plugged back to 10,582 feet, failed to flow for lack of gas, and was completed on the pump making 103 barrels daily, 29-gravity net oil. Total fluid was 257 barrels daily.

Michigan

Oceana County May Receive New Traverse-Lime Pool

A pool discovery in Western Michigan was in prospect with American Drilling Company's Skidmore 1, SE SW SW 9-13n-16w, Crystal Township, Oceana County, showing a hole full of fluid in 21 hours from Traverse limestone at 1782 feet. A bailer test two hours after pay was drilled showed 200 feet of oil, and further testing was delayed to bring in storage tanks and casing. Whether the fluid which filled the hole in less than 24 hours was all oil, or cut with water, was not immediately determined.

Original objective of the wildcat was the Dundee, charted for around 2500 feet. Excepting the drift string of 600 feet of 10-inch, no other casing had been set. Top of the Traverse was logged at 1780½ feet. A producer may set off a brisk drilling campaign in view of a dearth of discoveries for several months in Western Michigan. Moreover, acreage is nearly 100 percent controlled by small companies. C. W. Teater, Saginaw, originally took up the lease block on which the test is located, making a deal with American Drilling Company for the test. He retains a substantial interest in the well and block. The potential pool opener is about 12 miles north of the old Hart pool, which produced from the shallow Traverse.

6000 Barrels Potential

Rayburn and Major's Yenior 3, SE SW NE 22-19n-3e, Adams field, Arenac County, an inside well, developed a natural potential of 6000 barrels per day from Dundee at 2888 feet for the best well drilled this year in Michigan. It was bigger than any of the previous 10 producers drilled in the North Adams pool, opened last summer, and was expected to step up drilling of offsets and proven inside locations. As the field previously had been largely defined in area, the well promised little as to new area.

Union Drilling & Producing Company's Consumers 1, Section 16-20n-5w, Clare County, one of the most closely watched wildcats drilled in the basin this year, drilled the objective Dundee dry at 3811 feet, and was junked. Test logged Dundee at 3786 feet, structurally high, and although it did not show either oil or gas, it probably will lead to additional deep tests in the area because of its structure position. Several of the larger companies hold lease spreads in the district, and they contributed to Consumers 1.

Sun Oil Company was drilling below 5331 feet in McIntosh 1, Section 16-19n-3w, Clare County, with 4800 feet of water in the 5-inch hole making drilling progress difficult. The company hopes to get the Sylvania sand objective by resetting 5-inch at 4050 feet.

Gulf Refining Company had recovered 6432 feet of 4½-inch drill pipe from Bateson 1, Section 2-14n-4e, the state's deepest hole, 7776 feet, but was having trouble in attempts to make further progress. Obstructions have so far prevented getting either a cutter inside the pipe, or outside of it below the 6432-foot mark. Fishing and cutting operations have been hampered by a flow of oil, gas and water from the well.

Ask Allowable Boost to Keep Manila Field Flowing

An increased allowable for the Manila field, Jim Hogg County, has been requested of the Texas Railroad Commission to keep the field flowing.

Wells now get about 15 barrels a day, and a minimum of 25 barrels was requested.

W. J. Murray, Jr., commission engineer before whom a hearing was held, last week indicated that the commission's desire to keep the wells flowing was of less importance than keeping the allowable within market demand. He explained that the field allowable was apparently fixed on a basis that would give it parity with other fields of the same depth, the same spacing and producing the same oil. When the operators protested that their wells would go on the pump now instead of a year from now, he pointed out that the pumping stage comes invariably in every field.

Rocky Mountain States

Extensions for Cut Bank And Powder Wash Fields

The South Cut Bank field, Glacier County, northern Montana, was extended ⅝-mile southeast when McDonald, Henderson and Overcash's Tribel 1, NW NW NW 29-32n-5w, flowed 420 barrels daily from 2851 feet. The well had 46 feet of Cut Bank sand. It calls for two offset locations, one by The Texas Company and one by Hanna Porter Oil Company.

The Powder Wash oil and gas field, Moffat County, northwest Colorado, was extended a mile southeast in the completion of Mountain Fuel Supply Company's Musser 2-A, CW NW SW 4-11n-97w, which flowed 18,000,000 feet of gas from 2494-2504 feet in the Wasatch sand, Tertiary age. The company was moving in rotary equipment for Musser 3-A, NW SW 5-11n-97w, 1½ miles east of Musser 2-A. The Powder Wash field is the only Rocky Mountain oil field producing from sands in the Tertiary age, from which oil is definitely of Tertiary origin.

The California Company and The Texas Company's Unit 5, C NE NE 34-3n-9w, structurally high location on the Wilson Creek Dome oil field, Rio Blanco County, northwest Colorado, was coring at 6471 feet in objective formation, the Sundance. Should it develop production in this sand, it will open up a new horizon for the field. Of four other tests drilled in the field, three are producers in the Morrison formation, just above the Sundance, and one is a failure. These wells, encircling some 1500 acres in the center of which is Unit 5, developed water in the Sundance although they earlier had good oil showings in that sand.

Sinclair Wyoming Oil Company extended the deep Tensleep producing horizon of the Wertz field one location southeast with Wertz 15-A, SW SW NE 7-26n-89w, flowing 70 barrels per hour through choke on a 2-inch tubing. Total depth was 6103 feet, and 7-inch production casing was set on top of the sand at 5754 feet. The company spudded Wertz 20-A, NE SW NE 7-26n-89w.

An important extension test to the Garland field, Big horn County, northern Wyoming, resumed operations after a 5-month shutdown, N. B. Ketchersid's Mann 1, SWc 11-55n-97w, drilling at 600 feet. Location is in the south fault block area of the Garland structure, and two miles south and east of nearest production in the main part of the field. It is a south offset to Crosby & Huntington's Denio 1, lot 43-c, 14-55n-97w, which flowed 10 barrels of 48-gravity oil from 3220 feet in the Peay sands (Frontier). It was later lost through mechanical difficulties.

UNITED STATES WELL COMPLETIONS

Company, Well and Location	Init. Prod. Bbls.	Depth
Arkansas		
Columbia County (Dorcheat)—		
Shell, Keith 2, 9-18-22	360	8882
LaFayette County (Buckner)—		
Love, Owen & Whitwell, Waters Unit 1, 13-16-23	288	7262
Union County (Smackover)—		
Bob Milam, Childs 3, 8-16-16	65	2548
California		
Fresno County (East Coalinga Eocene)—		
Superior, Cagle B-8	1290	8224
Kern County (Canal)—		
Shell, KCL A-72-14	1611	8340
Kern County (Coles Levee)—		
Richfield, KCL-A 74-29 (pb 9350)	125	9384
Kern County (Greeley)—		
General Pet. Corp., Wallace 2	960	11,510
Kern County (Rio Bravo)—		
Union, Kernco 6-34	688	11,487
Kern County (Round Mountain Area)—		
Trico O. & G. Co., Coffee 5	40	1286
Kern County (Ten Sections)—		
Shell, KCL A56-29	2356	8235
KCL A-74-30	1866	8210
Los Angeles County (Long Beach)—		
Royalty Service Corp., 1C-1 (pb 6540)	100	6685
Los Angeles County (Wilmington)—		
Exeter Oil Co., Banning 1	170	3609
Union Pacific, UP 170	136	3924
UP-E-33 (pb 2832)	852	2855
Orange County (Huntington Beach)—		
Signal O. & G., Signal-Bolsa 1	No. Est.	3804
Signal-Bolsa 22	910	3405
Santa Barbara County (Santa Maria Valley)—		
Union, Moretti 3-1	1304	5275
Ventura County (Rincon)—		
CCMO Co., Hobson B-40	62	5503
Ventura County (San Miguelito)—		
Continental, Grubb 21	450	6884
General Pet., Padre 4 (pb 5266)	161	5300
Ventura County (Shiells Canyon)—		
Texas Co., Shiells 140	69	4100
Ventura County (Ventura Avenue)—		
British-American Oil Prod. Co., Hartmann 11	693	9111
Shell, Taylor 129	No. Est.	9862

*Failures; †Junked; ¶Million cu. ft. gas.

Company, Well and Location	Init. Prod. Bbls.	Depth
OLD WELLS DEEPENED		
Kern County (Fruitvale)—		
Meridian Oil Co., Turner 3 (otd 3319)	100	3460
Orange County (Huntington Beach)—		
Pac. Amer. Oil Co., No. 4 (otd 3230)	135	3890
Colorado		
Moffat County (Powder Wash)—		
Mountain Fuel, Musser 2-A, cw nw sw 4-11n-67w	¶18.0	2504
OLD WELL DEEPENED		
Rio Blanco County (Rangely)—		
John Bockhold, Government 6, se se sw 2-1n-102w (otd 1000 ft)	*	1605
Illinois		
Bond County—		
W. S. Tatum, Andrews 1, se ne sw 7-4n-2w	*	2537
Ripley Dome, Jeffries 1, se nw ne sw 21-4n-4w	12	485
Clay County—		
Pure, Moseley Cons 1, e½ nw nw 32-2n-8e	13	3075
Edwards County—		
H. C. Rife, Broster 1, se se se 9-9-3s-14w	*	1867
Fayette County—		
J. H. Foster, Soldner 1, sw sw sw 25-5n-4e	*	2686
Zephyr et al, Owens 1, nw ne se 31-6n-3e	65	1632
Clements, Rec., Smith 1, ne se ne 20-8n-3e	276	1586
Carter, Lilly 2, ne se se 17-8n-3e	*	1600
Purtillar School Trs. 1, nw sw nw 24-8n-3e	54	1536
Franklin County—		
Adkins, Orient 2, se sw se 24-6s-2e	420	2151
Hamilton County—		
Hollerman & Bruell, Moore 1, cs½ se nw 2-4s-6e	215	3466
W. W. Gray, Fee 1, ne ne ne 1-4s-7	10	3275
Howell, Campbell 1, sw ne ne 34-5s-6e	72	3075
Texas, Edwards 8, nw sw sw 35-5s-6e	100	3055
Edwards 6, ne se ne 3-6s-6e	275	3051
Ohio, Matheny 3, sw nw se 3-6s-6e	386	3088

Company, Well and Location	Init. Prod. Bbls.	Depth
Jackson County—		
W. R. White, Dean 1, nw ne nw nw 18-9s-3w	*	1245
Jasper County—		
Pure, Rohr Cons. 1, se ne 5-5n-10e	11	2820
Raef 1, nw se 32-6n-10e	419	2800
Marion County—		
Shell, Ververs 9, ne ne nw 18-3n-1e	200	1436
Montgomery County—		
Schneider & Gwin, Englehoff 1, nw ne sw 19-10n-4w	*	662
Dortmomedge, Ahrling 1, sec se 13-10n-5w	*	670
Jack Carson et al, Boehler 1, se nw ne 24-10n-5w	*	650
Richland County—		
Oil Well Dr. Co., Hilborn 1, nw sw ne 24-4n-9e	10	2601
Pure, Blain Cons. 2, nw se sw 24-4n-9e	10	2601
Kermicle 2, e½ sw se 31-5n-10e	41	2853
Wabash County—		
N. V. Duncan, Price 1, ne se nw 15-1n-12w	*	2470
O'Meara Bros., Harris 2, sw nw se 17-1s-12w	300	2369
Hudson-Hess, Smith 1, ne nw se nw 20-1s-12w	*	2425
Continental, Seiler 3, c se sw ne 34-1s-13w	312	2637
Phillips Pet., Schultz 12, sw se nw sw 7-3s-13w	208	2502
Washington County—		
W. C. McBride, Freeman 3, ne se nw 29-3s-4w	40	1019
Wayne County—		
Texas, Stone 1, s½ se sw 9-3s-7e	85	3344
Robinson et al, Betzer 1, w½ sw nw 10-3s-8e	*	3500
Pure, Benskin 1, sw nw nw ne 1-1n-7e	431	3090
Trotter 2, w½ ne sw 5-1n-8e	*	3110
McConnell 1, e½ nw nw 32-2n-8e	13	3075
White County—		
Longhorn Oil Co., Helm 7, se ne ne 27-3s-14w	100	2904
Carl Robinson, Metcalf 1, se ne se 31-3s-11e	*	3092
Buell & Herndon, Bond 4, ne nw ne 8-4s-14w	200	2830
Bond 4, ne ne ne 8-4s-14w	40	2815
Delta Dr. Co., Boultinghouse 4, sw sw nw 16-4s-14w	300	2842

[*Continued on next page*]

Summary of Drilling Operations in the United States, Week Ended March 1, 1941

	WELLS COMPLETED								PERMITS FOR NEW WELLS*				
		New Wells Drilled for Oil and Gas											
	Total for Week	Oil Wells	Gas Wells	Failures	Initial Production	†Miscellaneous	Total 1941	Total this Date 1940	This Week	Total this Month	Total 1941	Total this Date 1940	Year Total 1940
Alabama													
Arizona													
Arkansas	3	3			713		25	35			26	16	153
California	23	21			14,078	2	189	191	26	26	167	184	1,102
Colorado	2	1	1		6		2	2					
Florida													
Georgia													
Illinois	51	34		16	5,391	1	483	610	72	72	638	686	4,532
Indiana	7	2	2	3	85		76	70					
Kansas	43	29	1	8	39,925	5	324	255	50	50	331	270	2,048
Kentucky	1	1			35		50	44					
Louisiana	29	23	1	5	3,997		243	277	26	26	247	210	1,658
Michigan	16	4	1	11	6,235		132	241	14	14	138	226	1,093
Mississippi	2	2			866		24	27					
*Missouri	1			1			1	1	2	2	2		26
Montana	8	2	4	2	395		41	25					
*Nebraska	2	1		1	461		21		1	1	14		69
New Mexico	3	2		1	165		54	143	9	9	63	137	559
New York	12	7			39	5	107	195					
North Dakota													
Ohio	48	10	21	8	121	9	267	163					
Oklahoma	49	24	5	15	8,364	5	329	366	50	50	316	324	1,888
Pennsylvania	44	32	8	2	44	2	333	706					
South Dakota								1					
Tennessee								5					
Texas	175	126	4	45	83,517		1,446	1,837	202	202	1,409	1,936	11,170
Utah													
West Virginia	18	2	10	5	4	1	136	125				88	603‡
Wyoming	2	2			4,080		18	30					1
Total this week	539	328	58	123	168,521	30	4,301	5,349	452	452	3,351	4,077	24,902
Total last week	435	290	40	91	136,498	14	3,762	4,825	415	1,682	2,899	3,561	24,902
Total this year	4,301	2,715	414	1,011	1,350,167	161							

* This tabulation includes those states where weekly data are available; figures for Missouri date from August 10, 1940; Nebraska from August 3, 1940.
‡ For first 9 months of 1940 only. † Includes old wells deepened, water-intake, gas input and salt water disposal wells.

United States Well Completions—*Continued*

Company, Well and Location | Init. Prod. Bbls. | Depth

ILLINOIS—Continued

Pruett et al, Boultinghouse 2, nw se se ne 17-4s-14w 90 2584
W. W. Gray, Fee 3, sw ne ne 20-4s-14w 130 2857
Skelly, Daly Trs. 1, ne ne nw 20-4s-14w 81 2306
Ill-Mid-Cont., Brown 1, sw ne ne 2-4s-9e 91 3453
Bell Bros., Morris 21, sw nw nw 21-5s-14w ..... * 3109
Exchange, Johnson 1, se se nw 26-6s-8e 131 3126
Ryan, Keck 1, ne nw se 36-6s-10e * 3010
R. Halbert et al, Hubele 1, ne nw sw 7-6s-11e ..... * 3035

OLD WELL DEEPENED

Hamilton County—
Mammoth P. & R., Jackson 1, swc nw 35-5s-6e (otd 2951)..... 250 3042

Indiana

Decatur County—
Hoosier Public Utility, Veerkamp 220, c se ne 15-9n-9e..... ¶13 931
Gibson County—
Continental, Keck 12, ne sw sw 26-3s-14w (PB 2585)..... 25 2601
Posey County—
J. S. Roberts, Keck 1, nwc ne nw 34-3s-14w ..... * 2896
H. K. Riddle et al, Welch et al 1, ne ne ne 10-4s-14w..... * 3004
Gulf, Dickhaut 3, se nw sw 5-6s-12w * 2402
J. McCummings et al, Oakland City College 1, nw nw se 16-8s-14w... 60 2569
Sullivan County—
Reed et al, Coffman 1, c s½ s½ ne 35-8n-10w ..... ¶1.0 798

Kansas

Barber County—
Barbara O. & G. Co., Holmes "A" 4, csl sw nw se 15-33-13w..... * 4870
Barton County—
Phillips, Weber 3, c s½ se nw 13-16-12w ..... * 3398
Darby, Bitter 2, c s½ sw ne 5-16-13w 3000 3368
Shell, Schneider "B" 12, swc ne 1-16-14w 3000 3300
Carter, Burmeister 2, c w½ sw nw 2-17-11w 391 3355
Deep Rock, Burmeister 1, c w½ sw ne 2-17-11w 378 3416
Magnolia, Koetzel 7, nec 25-20-11w 146 3273
Butler County—
Cities Service, Stokes 93, nw sw ne 33-25-5e 22 1992
Woodard, Rutherford 1, ne sw sw 8-29-5e 30 1848
L. & M. Oil Co., Creed 4, se sw sw 17-29-4e 35 1896
Ellis County—
Deep Rock, Baumer 31, c e½ ne sw 27-11-17w 3000 3574
Stearns, Witt 1, c s½ ne sw 28-12-16w (pb 3482)..... 647 3626
Gulf, Rome 1, c w½ sw sw 19-13-16w ..... * 3539
Ellsworth County—
Duwe & Farris et al, Boye 2, c e½ sw sw 9-16-10w.....2753 3362
Gulf, Grizzell 10, c s½ ne nw 31-17-10w 128 3298
Graham County—
Cetal, Hixembaugh 1, se ne ne 1-6-21w ..... * 3540
Greenwood County—
Sinclair-Prairie, McKee 25, c ne nw 32-23-10e 5 2347
Henderson, Schneider 4, se nw sw 9-23-13e 20 1776
Marion County—
Lorieaux et al, Hegley 1, c s½ se nw 21-17-4e 15 2445
McPherson County—
H. & M. Dr. Co., Lewis 1, c e½ sw nw 36-19-2w 210 2966
Pratt County—
Drillers Gas Co., Fitz-Williams 1, c n½ ne sw 35-27-11w.....¶36.27 4316
Rice County—
Continental, Gray 2, se nw sw 19-18-7w 3000 3203
Continental et al, Ainsworth 6, sw ne se 24-18-8w.....3000 3198
Hinkle, Kitchen 1, c w½ nw ne 11-18-9w ..... * 3324
A. R. Jones et al, Schultz 1, nec nw 13-18-10w (pb 3258)..... 20 3264
Shell, Reece "C" 1-A, ne nw 16-19-9w (pb 2907)..... 81 3243
Bunting-Dowling & Skow, Mantz 1, c w½ sw ne 17-19-10w..... * 3365
Colorado Pet. Corp., Keesling "A" 2, c n½ nw nw 10-20-9w..... 536 3232
Cochran, Miller 1, ne nw nw 31-20-9w ..... * 3375

Rooks County—
Broadview, Livengood "C" 2, c w½ sw ne 1-9-16w.....2162 3258
K. A. Nill, Dopita 2, c nw sw 31-8-17w 599 3429
Russell County—
Texon, Hall 6, cwl sw se se 26-14-13w 410 2900
Helmerich & Payne, Boxberger 6, sw nw ne 21-14-14w.....1849 3116
Hartman & Blair, Boxberger 4, se sw ne 26-14-14w.....3008 3023
Stafford County—
Shell, Meyer 1, ne nw se 21-23-12w ..... * 3854
Stanolind, Richardson 4, se sw nw 10-24-11w 2264 3792
Magnolia, Tretbar 3, c s½ ne se 12-24-11w 3000 3730
E. H. Moore, Stewart 8, c n½ nw ne 12-24-11w 3000 3753

OLD WELLS DEEPENED

Ellsworth County—
Central Pet., Francis 3, c s½ se nw 19-17-9w (otd 3232).....3000 3240
Russell County—
Stanolind, Bronson 4, ne sw se 20-11-15w (otd 3106) (pb 3270) 44 3339
Skelly, Opdycke 11, c s½ s½ sw 29-14-13w (otd 2889)..... 172 2943

SALT WATER DISPOSAL WELLS

Barton County—
Magnolia, Roesler 2, c s½ ne nw 1-18-11w (otd 3380)..... ... 3686
Ellsworth County—
Skelly, Meyer 3, c w½ nw ne 35-16-10w 3792

Kentucky

Ohio County—
J. C. Miller, J. & E. Smith 21..... 35 294

North Louisiana

Caddo Parish (Pine Island)—
L. L. Lanier, et al, Spell 1, 12-20n-16w 16 1572
Magnolia, Herndon 14, 22-21n-15w. 250 1590
P. D. & E. Oil Co., Burton 2, 1-20n-16w ..... * 1665
S. Reele, Ramsey 2, 32-21n-15w.... 25 1601
W. E. Stewart et al, Robertson 1, 31-21n-15w 30 1525
Weaver-Perry Oil Corp., Pardue 2, 33-21n-15w 18 1557
Claiborne Parish (Homer)—
Louark Prod. Co., Lowenberg 38, 13-21n-8w 30 1450
Claiborne Parish (Sugar Creek)—
Haynes B. Owenby, Ozley C-1, 7-19n-5w .....¶14.0 5820
La Salle Parish (Olla)—
Arkansas Fuel Oil, Tremont Lbr. Co. C-11, 3-9n-2e..... 250 2300
Madison Parish (Wildcat)—
H. L. Hunt, Lancaster 1, 3-14n-12e. * 6725

South Louisiana

Calcasieu Parish (Iowa)—
Magnolia, Walt 17..... 295 7625
Cameron Parish (Cameron Meadows)—
Magnolia, Cameron Meadows 30.... 395 5725
Cameron Parish (West Hackberry)—
Superior Calif., Vincent 1-A..... 138 7788
Evangeline Parish (Ville Platte)—
Continental, Fontenot 5..... 81 10064
Continental, Tate 7..... 245 10137
Danciger, Pitre 2..... 290 10147
Iberia Parish (Bayou Pigeon)—
Plymouth, Tilly 1..... 552 8372
Iberia Parish (New Iberia)—
Wm. Helis, Bolivar 4-H..... 32 1874
Iberville Parish (Wildcat)—
Titanic, Natalbany 1..... 238 9031
Jefferson Davis Parish (South Roanoke)—
Continental, Jaenke 1..... 36 11535
LaFourche Parish (Golden Meadows)—
Brown-Woods, Dantin 1..... 179 5502
LaFourche Parish (Leeville)—
Texas, LL&E-Leeville 81..... 291 8093
St. Landry Parish (Port Barre)—
Pan American, Garland 8..... 265 5583
St. Martin Parish (Anse La Butte)—
W. R. Davis, Voorhies 1..... * 8966
Iberia, Moresi 4-A..... 100 2448
Stanolind, Bergeron 3..... 203 4826
St. Martin Parish (Happytown)—
Shell, Iberville Land Co. 3..... * 9947
Vermilion Parish (Abbeville)—
Continental, Motty 1..... 38 10566
Terrebonne Parish (Wildcat)—
Stanolind, Continental Ld. & Fur 1 * 11010

Missouri

Atchison County—
Jackson & Rust, Hays 1, c ne ne 22-66n-42w ..... * 2192

Michigan

Allegan County—
C. W. Cook, Larson 1, se ne ne 26-3n-14w ..... * 1448
W. L. McClanahan, Brockhuis 1, se sw se 11-4n-14w..... * 1602
Regal Dutch Pet. Co., Van Dam 1, nw ne ne 14-4n-14w..... * 1598
Miller Bros., Green 1, new sw nw 21-1n-13w 25 1357
C. J. Steven, Shafer 1, ne se sw 29-1n-13w ..... * 1352
Arenac County—
Rayburn & Major, Yenior 3, se sw ne 22-19n-3e 6000 2888
Clare County—
Union Dr. Co., Consumers 1, n½ nw nw 16-20n-5w..... * 3811
Gratiot County—
W. E. Ross, Wanamaker 1, c se 31-11n-4w ..... ¶8 980
Kent County—
Clifford Perry, Mich. Trust 1, se ne se 23-5n-12w..... * 1710
Lenawee County—
Voorhees Dr. Co., Gillen 1, n½ n½ 12-9s-1e ..... * 920
Manistee County—
W. P. Shoemaker, Rogers 1, c s ne se 34-23n-16w ..... * 2585
Montcalm County—
Belvidere Oil Co., Shaffer 1, c ne 25-12n-7w ..... * 1346
Oceana County—
Muskegon Dev. Co., Sweet 1, ne sw se 23-13n-16w ..... * 1975
Ottawa County—
Smith Pet. Co., Fenske 6, se ne nw 34-7n-13w 60 1869
Van Buren County—
Clapsaddle & Harris, Canute 1, se sw sw 10-1s-14w..... 150 1280
Shock 2, se ne nw 15-1s-14w.... * 1281

Mississippi

Yazoo County (Tinsley Dome)—
Union Prod. Co., Childress-Jones Unit 2, 24-10n-3w..... 366 5027
Perry 1, 23-10n-3w 500 4637

Montana

Big Horn County (Hardin)—
Big Horn Oil & Dev. Co., No. 44, nw se ne 16-1s-33e.....¶0.05 790
O. T. Hardin, Becker 1, lot 11, block 12 23-1s-33e .....¶0.01 695
Blaine County (Bowes)—
Montana Gas Corp., Bjornsen, se ne nw 34-32n-19e .....¶20.0 845
Fallon County (Cedar Creek)—
Montana-Dakota Util. Co., No. 149, sw sw 7-4n-62e .....¶0.04 1461
No. 150, sw ne 13-4n-61e.....¶0.5 1550
Glacier County (Cut Bank)—
Dakota-Montana Oil Co., Tribel 2, lot 5, 15-34n-6w..... 147 2920
Glacier Prod. Co., State 9, w w sw 16-33n-5w 150 2949
A. Kately, Agent, Hagerty 1, ne nw 15-34n-6w ..... * 2954
Santa Rita O&G Co., Government 5, lot 1, 7-32n-5w..... 245 2961
Phillips County (Bowdoin)—
Montana-Dakota Co., No. 618, csw sw 3-32n-33e .....¶0.75 1074
No. 623, cnw ne 34-32n-33e.....¶0.5 1042
No. 627, csw sw 17-31n-34e.....¶1.0 1030
Toole County (Aloe Nose)—
Hole Brothers Co., Potter 1, cne ne 23-33n-4w ..... * 2090
Toole County (Devon)—
Frank P. Walsh Co., Mowat 1, sw nw se 7-33n-2e..... * 1616
Toole County (Kevin-Sunburst)—
Consumers Gas, Krutzfeld 2, ne ne sw 26-34n-1w ..... * 1218

Nebraska

Otoe County—
Ingersoll et al, Hooks 1, nec se 3-7n-14e ..... * 1500
Richardson County—
Ohio, Sandrock 6, sw nw ne se 20-1n-16e 461 2260

New Mexico

Eddy County (Wildcat)—
Black-Ratliff et al, Simmons 1, c se nw 9-21s-25e ..... * 1252
Lea County (Maljamar)—
W. J. Rutledge, Jr., et al, State-Texaco 1-O, sec sw 16-17s-32e.... 83 4122
Lea County (Skelly)—
Skelly Oil, Sims 15, c e½ se se 33-22s-37e 82 3674

New York

Allegany County—

Company, Well and Location	Init. Prod. Bbls.	Depth
Hardman & Thompson, Hazzard farm, Wirt	5	1325
Messer Oil Corp., Miles farm, Bolivar	6	1430
Hardy & McBride, Garthwaite farm, Alma	6	1325
Bradley Prod. Corp., Fitz-Carrol farm, Bolivar	7	1440
Bohne Bros., Helmhold farm, Wellsville	4	1384
Shaner & Dermitt, Wetherby farm, Bolivar	5	1376
Forest Oil Co., Ackerman farm, Wirt	8	1423

WATER INTAKE WELLS

Allegany County—

Franchot Oil Co., Murphy farm, Alma	...	1521
South Bolivar Oil Co., McKelvey farm, Bolivar	...	1352
Messer Oil Co., Miles farm, Bolivar	...	1430
Bradley Prod. Corp., Duke farm, Alma	...	1431
Roy E. Vossler, McEnroe farm, Alma	...	1274

Ohio

Ashland County—

Lyons et al, Chandler 2	¶0.53	2854

Athens County—

Wickens et al, Balderson 2	¶0.5	848
Fairfield Gas Co., Varner 6	¶0.15	1235
Snyder et al, Burdette 1	*	1250

Belmont County—

Barnesville Dev. Co., Skaggo 1	¶1.0	891

Cuyahoga County—

Benedum-Trees, McGurer 2	¶1.0 & 3	2853
Smith 1	*	2925

Holmes County—

E. O'Hall, Fee 1	*	3343

Jefferson County—

Costonia Oil, Jewett 2	*	1495

Knox County—

Max Johnston, Mickley 1	¶.04	2798
J. B. Reed, McDermot 1	¶0.37	2822
Brooks Johnson, Frye 1	*	2771

Lawrence County—

Ohio Fuel, Schneider 1	¶0.05	2638

Licking County—

Monroe Oil Co., Hughes 4	10	680
H. Leightner, Reidenour 2	8	810
Geo. Lacknette et al, Newark Water Works 1	¶0.84	2564
McClay Bros., Norwell 1	¶0.02	2388
Ohio Fuel Gas, Bower 1	*	2771

Lorain County—

Williams Prod. Co., Gest 1	2	167
Wiser Oil, Sooy 3	¶0.18	2421
Wm. Dempsey, Bunt 1	*	215

Medina County—

Clyde Cole, Culler 1	4	558
Marine Trust, Wertz A-7	5	400
Wertz A-8	5	410
Wertz A-9	5	395
Wertz A-14	5	439

Meigs County—

Nolan Shuster, Nelson 2	¶0.1	731

Monroe County—

E. C. Humphries, Rucker 1	¶0.18	1215
Otto Spangler et al, McCort 1	¶0.05	1580

Morgan County—

Crowley, Bowman 5	¶0.45	1013

Muskingum County—

Atha Oil Co., Frick 1	65	3855
Gas Prod. Co., Smith 1	12	4210

Noble County—

Clymes et al, Hutcheson 1	¶0.05	1579

Stark County—

Lyons et al, Fasnacht 1	¶0.54	4441

Tuscarawas County—

Nat. Gas Co. of W. Va., Dayton 1	¶0.73	4611

Washington County—

Anderson et al, Evans 1	¶0.36	1585
McTaggart, Stribling 1	¶0.3	1270
Beardmore Oil Co., Cline 1	¶0.08	1900
John Wagner, Wagner 1	*	1945

INJECTION WELLS

Medina County—

Marine Trust, Wertz O-8	...	412
Wertz O-9	...	399
Wertz O-10	...	440
Wertz O-11	...	420
Wertz O-16	...	432
Wertz O-17	...	454
Wertz O-18	...	473
Wertz O-19	...	414
Wertz O-24	...	448

Oklahoma

Bryan County—

Pure, Little (106) 2, sw nw sw 27-5s-7e	3512	5068

Carter County—

Jones, Ford 1, c se nw 13-4s-3w	*	3675

Comanche County—

Stogner, Lowe 3, ne se nw nw 7-1n-10w	*	210

Creek County—

Shell, Orr 1, sw nw nw 32-15n-7e	324	4088
Tilley, Wright 6, ne ne se 17-17n-8e	5	2358
Jackson, Gregory 1, ne sw se nw 29-17n-11e	¶1.8	1939
Carpenter, Cornelius 1-A, nwc 33-18n-11e	20	1566
Big Four Pet. Co., Vance 5, se ne ne 24-19n-7e	*	3472

Garvin County—

Cox & Hamon, Tate 5, ne sw sw 29-1n-3w	352	2300

Grady County—

Palmer, Ramsey 1, sec ne 31-5n-8w	*	6446

Jackson County—

Pierce et al, Hardcastle 2, ne se sw 15-1n-20w	36	1547

Kiowa County—

Phillips, Warner 3, se ne se 19-7n-17w	1328	1151
Pape et al, Wright 1, nw sw ne 3-7n-20w	*	2002

Lincoln County—

Berkey, Gragg 4, nw se se 32-12n-6e	*	3302
Coralena, Dean 1, swc 28-16n-4e	*	70

Muskogee County—

Curtiss, Burford 1, ne ne 21-14n-19e	¶0.1	578

Noble County—

Portable et al, Conway 1, nec 16-23n-2w	*	4899

Okfuskee County—

Shell, Davis 1, swc 18-13n-9e	*	4128
McMahon, Hackensmith 1-A, sw ne se 13-13n-10e	¶2.5	2624

Okmulgee County—

Brookhaven, Milan 1, nw nw se ne 7-13n-14e	40	2047
Pine, Carruth 6, nw nw se 18-13n-14e	1	478
Green et al, Ashley 9, c se ne 29-14n-14e	*	1257

Osage County—

Gled, 4, se se ne se 16-24n-8e	20	570

Pawnee County—

Johnson O. & Ref. Co., Smith 1, ne se nw 22-20n-9e	0.77	2258
Valley Osage, Blackmer 2, nw sw ne 22-20n-9e (pb 2122)	¶0.75	2170

Payne County—

Blackwell, Berry 2, c w½ ne ne 14-17n-1e	135	4890
Texas, Graham 4, c e½ se sw 12-17n-1e	*	5542
Gulf, George 4, nw sw nw 4-19n-5e (pb 3228)	56	3231

Pontotoc County—

Huddleston, Patterson 2-A, nw ne se sw 20-5n-8e	20	956

Pottawatomie County—

Culver & Shepherd, Waite 3, nw sw ne 9-5n-5e	1536	2602
Vierson, Burnett 1, nec 34-6n-4e	*	3068
J. F. Smith, Brundage 1, ne nw se 6-7n-4e	110	4055
Timms 1, nw ne se 26-8n-4e (pb 4166)	125	4473
Mudge, Hollingsworth 1, se sw sw 24-9n-4e	125	4272

Seminole County—

Rankin & Moore, Sanders 1-B, sw nw sw 27-6n-5e (pb 2759)	25	2787
Norbla et al, Bryant 1, swc nw 7-6n-8e	*	3167
J. F. Smith, Smith 2, sw ne ne 20-7n-6e	147	2362
Delaney et al, Clark 1, nec se 30-8n-7e	191	4289

Stephens County—

Clark & Cowden, Payne 6, sec sw 2-1n-5w (pb 3874)	30	4330
Keister, Wilkenson 2, nw ne se ne 16-1s-5w	3	513
Vaughn et al, Baker 2, c sw ne 35-2s-6w	*	1737
Pace, Allen 27, se sw ne ne 3-2s-8w	125	2211

Tulsa County—

H. M. Bowman, Morey 17, c sw nw 15-17n-12e	12	1576
J. A. Eagen, Sand Springs Home 1, ne nec se 6-19n-11e	*	1719

OLD WELLS DEEPENED

Okfuskee County—

Summit, Steil 7, se se ne sw 18-10n-11e (otd 1251)	17	2162

Jackson County—

Gulf, Herbert 6, ne se ne 9-1n-20w (otd 1451)	4	1668
Altus, Maud 3, se sw ne 15-1n-20w (otd 1562)	*	1629

Seminole County—

Cities Service, Davis "A" 1, nw ne ne 30-7n-8e (otd 4129)	21	4150
Magnolia, Anderson 1, ne nw se 18-9n-6e (otd 4370)	38	4411

Pennsylvania

BRADFORD DISTRICT

Messer Oil Corp., Loop	1	....
Tapp, Gallets & Ruffington Trs., Fee	2	....
A. Schorman, Morehouse	3½	....
Lloyd & Hardy, Meehan	2	....
Pine Run Oil Co., Bing 130-1-2-3-4-6	3	....
Bradford Tr. Co., 21 wells	21	....
Forest Oil Corp.	1	....
Forest Pet. Corp.	1	....
Niagara Oil Corp.	5	....

NEW YORK-PENN GAS FIELD

New York State Nat. Gas, White	¶	....
Noble	¶	....

MIDDLE DISTRICT

H. L. Helschel, Fee	1	....
M. M. Master, Gibbs	*	....
Church & Baldwin, Duke	2	....

BUTLER-ARMSTRONG DISTRICT

Sipe Bros. et al, Elmer Montag	1	....

SOUTHWEST DISTRICT

Armstrong County—

Peoples Nat. Gas, Boyer 3	¶0.07	3635
Boyer 2	¶0.04	3720
J. K. Sharp & Co., Sefton 1	¶0.03	3470
Equitable Gas, Wilson 1	¶0.02	3539

Clarion County—

T. W. Phillips G. & O. Wolfgang 1	*	3154

Washington County—

Carnegie Nat. Gas, Blake 1	¶0.19	2677
Keystone, Ross 2	¶0.04	1570

WATER INTAKE WELLS

Bradford District—

D. Y. M. Corp. No. 6, 466 Bing	...	....
Forest Petroleum Corp.	...	....

East Texas

Joiner Area—

C. E. Cooper et al, Deason 4 (3-ac)	1600	3661

Kilgore Area—

H. E. Exum, Tr. (Trapshooter Reilly O&R Co.), Mitchell 11 (6¼-ac)	3200	3581
V. J. Pearson et al, Young 3 (½-ac)	1000	3570
Potter Bros. Prod. Co., Griffin 7-A (71/100-ac)	1200	3578
Shell, Elder 52 (196-ac)	2400	3678
Sun Oil, Walker 7 (271.46-ac)	500	3731

Longview Area—

C. F. Smith et al, Jones 5 (5-ac)	6000	3570
Jones 6 (5-ac)	7200	3575
E. N. Smith et al, Richey 2 (2-ac)	5500	3584
Stanolind-Falcon Co., Everetts 13-C (59.46-ac)	750	3684

Bowie County (Wildcat)—

A. L. Willis & Son, Taylor 1	*	4002

Smith County (Chapel Hill)—

Shell, Browning 1	276	8355

Trinity County (Wildcat)—

R. W. Burnett et al, Southern Pine Lbr. Co. 1	*	2567

Harrison County (Waskom)—

Union Prod. Co., Bryson A-1, T. D. Wilson sur	¶4.25	6115

West Central Texas

Callahan County (Wildcat)—

B. C. Mann et al, Wildham 1	*	1522

Jones County (Wildcat)—

Shaheen Oil Co., Young 1-a	*	2261

Jones County—

F. K. Johnson-Ungren-Frazier, Sayles 5	159	1953
Snoddy Bros. et al, Curry-Sinco 1	*	2346

Shackelford County (Wildcat)—

C. V. Welch et al, Baker 1	*	1648

Shackelford County—

L. H. Choate et al, Dyer 4	*	1260
Kittery Oil Co., Hendrick 2	¶2.0	1626
Roeser-Pendleton-Conoco, Cook 2-A-118	95	1697

Taylor County (Wildcat)—

J. B. Robertson-Jim Dunigan, Cresswell-Shell 1	*	3877

Taylor County—

W. J. Walsh et al, Young 1	109	2384

Texas Panhandle

Carson County—

Skelly Oil, Schafer 113	158	3104

Gray County—

Cities Service, Meers 7-C	43	3244
Moran Bros. Dr. Co., Skidmore 7	199	3303
Phillips Pet. Co., Benton 4	104	3180
Rock Oil Co., Vicars 1	239	3305

Hutchinson County—

Benonine Oil Co., Starnes 7	162	3198
Starnes 8	125	3200
J. M. Huber Corp., Weatherly 12-A	2650	3037
Mid-States Oil Corp., Whittenburg 33-A	422	2870
Paloma Oil Co., Lewis 8	218	3100
Shell, Harvey Sisters 10-B	275	3049

Moore County—

Shamrock O. & G. Co., Makeig 1	¶147.0	3301
Powell-Magnolia 1	380.0	3049

Wheeler County—

Skelly Oil, Derrick 18	159	2483

United States Well Completions—*Continued*

South Texas

CORPUS CHRISTI DISTRICT

Jackson County (Lolita)—
Walter Goldston, Missouri Pef. Ry. 3 600 6407
Humble, L. Ranch 11-A..... 950 5282
Magnolia, Mitchell 10..... 500 5285
Standard of Kansas, Willoughby 2 400 5295
Jackson County (West Ranch)—
Humble, Vanderbilt-State 7-B..... 450 5782
Magnolia, West Ranch-State 2..... 975 5751
West 115-A 1150 5104
West 130-A 500 5576
West 131-A 1100 5127
Jim Wells County (Wade City)—
T. H. McElvain, Blaschke 5..... * 4911
Nueces County (Agua Dulce)—
Texon, Driscoll 5.....¶70.0 & 300 6921
Nueces County (Bentonville-King)—
Southern Minerals, Walker 5..... 300 5650
Nueces County (Minnie Bock)—
Phillips Petr. Corp., Howze 1..... 175 3875
Nueces County (Stratton)—
Corpus Christi Corp., Wardner 14.. 375 6616
Gulf Plains, Texon Royalty Co. 2 .....¶100.0 & 500 6452
Nueces County (Wildcat)—
Stanolind, Shaffer 1, 271-ac tr, lot 7, blk 4, Luby subd, 1½ mi w Luby fld ..... * 7483
San Patricio County (Midway)—
British-American Producing Co. Co., Coggin 1..... 425 6200
Midway-Victory, Floerke 3-A..... 500 5350
Phillips, Ivey 5..... 350 5396

LAREDO DISTRICT

Duval County (S. Charamousca)—
Magnolia, Duval Co. Rch. Co. 1 (281) ..... * 2492
Duval County (Wildcats)—
Graham Bros., Holzapfel 1, sur 178, 40-ac lse, 1320 ft n Giblin 1 Holzapfel ..... * 1300
Wilcox O&G & Henderson Coquat, Garcia 1, 1135-ac tr, 7500 ft se Chiltipin fld ..... * 5518
Jim Hogg County (Colorado)—
Humble, Atwood 27..... 500 3111
V. F. Neuhaus, Martinez 6-C..... 350 3009
Jim Hogg County (Kelsey)—
Humble, Juarez 1..... 64 4748
Jim Hogg County (Manila)—
Bridwell, Zachry 2..... 500 2625
Starr County (N. Rincon)—
Sun, Coates 2..... 400 5109
Webb County (Glen)—
Transwestern, Yaeger-Strohman 7.. 75 2154
Webb County (Wildcat)—
J. M. Anderson, Benavides 1, sur 713, 320-ac lse, West Cole area... * 3407
Zapata County (Wildcat)—
Jose Martinez, Volpe Bros. 1, sh 31, proc 16, 200-ac lse, 12 mi sw Lopena ..... * 1005

SAN ANTONIO DISTRICT

Guadalupe County (Elm Creek)—
Jack A. West et al, Hartfield 3.. 3 782
Williamson County (Byersville)—
R. Clark, Freels 1, 91-ac tr, Hamilton White sur, outpost..... * 1151

Texas Gulf Coast

Brazoria County (Manvel)—
Texas, Belcher B-30..... 430 5144
Brazoria County (Old Ocean)—
Harrison & Abercrombie, Wilson 2 501 10250
Stanolind, McDonald 1..... 73 11025
Brazoria (West Columbia)—
Texas, Phillips 20..... 507 5680
Brazoria County (Wildcat)—
Strake, Griffith 1..... 164 10333
F. W. Zelcer, Investment Securities 1 ..... * 8000
Galveston County (Green's Lake)—
Sun, Houston Farms 5..... * 6886
Harris County (Dyersdale)—
Frazier, Reid 1..... 298 4862
Harris County (Tomball)—
Humble, Reid 23..... 42 5563
Harris County (Wildcat)—
Cockburn-Frazier-Hargrove, Meyer 1 ..... * 5512
Liberty County (Hardin)—
Texas, Humphries 6..... 317 7654
Matagorda County (Bay City)—
Skelly, Cobb 20-B..... 270 7495
Matagorda County (Buckeye)—
United North & South, Stoddard 2 * 8010
Matagorda County (South Bay City)—
Hamman Exploration, Minter 1.... 177 9368
Matagorda County (Wildcat)—
Cities Service, Duffy 1..... * 9211
Montgomery County (Wildcat)—
Superior Calif., McWhorter 1..... 208 9250
Waller County (Wildcat)—
Mayo-T. A. Carlton, Donnigan 1.. * 8010
Wharton County (Withers)—
Texas, Pierce C-89..... 130 5378
Pierce C-90 ..... 132 5376

North Texas

Archer County (Wildcats)—
Adams O&G Co., Powell 1..... * 5261
Fish & Fish,Prideaux 1..... * 852
Shappell Oil Co., Lyles 15..... * 4875
H. F. Smiley et al, Tarr 1..... * 1400
Underwood Dr. Co., Kunkel 1..... * 1289
Archer County (Hull-Silk)—
Ligon Est. & Deep Oil Dev. Co., Moss 7-A 624 4342
Archer County (Hull-Silk Deep)—
Helmerich & Payne, Wilson 1-A...1584 4624
Peterson & McCarty, Wilson 40-B.. 592 4633
Archer County (K-M-A)—
A. R. Dillard et al, K. & K. 13-A.. * 4629
Archer County—
C. T. Hedges et al, Harmel 19-C.. 8 1278
W. T. Hutchinson Jr. et al, Ikard 1 * 1352
Roy King et al, Stinnett 2-A..... 10 734
Pet. Producers Co., King 1..... 269 1257
Rathke Oil Co., Cowan 2..... * 1164
Baylor County (Wildcat)—
British-American O.P. Co., Cowan 1 58 2547
Clay County (Antelope)—
Shell, Coburn 6..... 552 3256
Clay County—
Akin-Dimock & Costley, Patrick 2 * 1341
Duncan-Arnhold et al, Duncan 20.. 76 1198
Metzner & Burns, Thornberry 26.. 3 178
Sussex Oil Corp., Glasgow 20..... 10 1090
McInness 1 ..... 10 1255
Cooke County (Walnut Bend)—
Magnolia, Ramsey 12..... 268 4724
Sinclair Prairie, Ramsey 6..... 163 5051
Cooke County (Wildcat)—
Bridwell Oil Co., Fisher 1-A..... * 2013
Cooke County—
Humble, Hellman 10..... 291 1306
Hellman 11 ..... 135 1331
Jack County—
B. C. Gilmore et al, Wright-Texaco 1 ..... * 775
Trentman-Nunnelle & Showers, Owens 4 ..... 324 3154
O. J. Perrin et al, Rhodes 8..... 608 3157
Montague County (Benton-Holmes)—
United Prod. Co.-Continental, Custers 2-B (new pay) (pb to 2290) 648 3612
Montague County (Wildcat)—
J. G. Hammond, Jester 1..... * 7176
Throckmorton County—
W. Neustadt et al, McKeichan 5.. * 860
Wichita County (K-M-A)—
Grace & Murphree, Burnett 4..... 432 4133
Wichita County—
Akin-Dimock-Costley, Dodson 1-A. 30 1330
Geo. W. Cooper et al, Waggoner Est. 34-C 5 690
W. L. Hawkins et al, Warren 1.... * 1790
W. E. Prod. Co., Glass 3..... * 1329
Wilbarger County (Fargo)—
Amerada, Folley Unit 1 (pb 4000 ft) 600 4669
Wilbarger County—
Christie-Hickman Dr. Co., Waggoner Est. 2..... 25 1918
Young County (Wildcat)—
L. T. Burns et al, Bloodworth 1.. * 903
Young County—
Cato Bros. et al, Hamilton 5..... 10 890
Johnson & Kouri, Hamilton 1..... * 928
Kimmell, Lee & Co., Campbell 3-B 123 970
W. J. Milmo et al, Stewart 2..... * 878
Panhandle Ref. Co., Taylor 4..... 35 2781

West Texas

Andrews County (Embar)—
Phillips Pet. Co., Cowden-Embar 2 * 5864
Cochran County (Slaughter)—
Magnolia, Woodley 2.....1064 4993
Crane County (Sand Hills)—
Humble, Tubb 2-D..... 276 4412
Crockett County (Wildcat)—
E. M. Wahlenmaier & Currie, Bean 1-A 215 1456
Ector County (Foster)—
Forest Dev. Corp., Moss 3-A..... 379 4200
Moss 2-H 439 4285
Kewanee Oil Co., Foster 1..... 480 4255
Ector County (North Goldsmith)—
M. A. Grisham et al, Cowden 3, sec 4 ..... 250 4460
Ector County (Goldsmith)—
Gulf, Goldsmith 338..... 991 4218
Goldsmith 340 .....1133 4238
Ector County (Jordan)—
Cities Service, University 6-B..... 342 3595
Ector County (North Cowden)—
Cities Service, Rhodes 13.....1751 4185
Ector County (Wildcat)—
Stanolind, Cowden 1-B..... * 7000
Gaines County (Cedar Lake)—
San Andres Prod. Co., Johnson-Sun 1 ..... * 5100
Gaines County (Seminole)—
Amerada, Hahn 3..... 860 5335
Lamb 2 ..... 800 5305
Northrup-Carr 1 ..... 463 5370
Humble, Matthews 2..... 420 5330
Gaines County (Wasson)—
Continental & Amon Carter, Langdon 9-44 ..... 806 5041
Hockley County (Slaughter)—
Magnolia, Mallet 3-D.....1237 5000
San Andreas Prod. Co., Caddell 2-A 269 5010
Caddell 4-A 277 5006
Stanolind, Slaughter 10-A.....1253 5047
Tide Water, Lincoln 2..... 788 5003
Howard County (Wildcat)—
Cosden Pet. Corp., Fee 1..... * 1507
Mitchell County (Northwest)—
Staley Oil Co., Mills 1..... 267 1745
Pecos County (Masterson)—
Magnolia-Anderson-Prichard Oil Cor., Powell-State 1..... * 1657
Pecos County (Walker)—
Shasta Oil Co., White-Baker 1.... 123 2070
White-Baker 2 ..... 227 2042
Ward County—
Atlantic & Standard of Texas, University 1, sec 12..... 624 2939
Gulf, Hutchings 152..... 604 3075
O'Brien 154 ..... 445 2775
Winkler County (Keystone)—
J. R. Sharp et al's Jenkins-Gulf 2 210 3402
Jenkins-Little 1 ..... 290 3391
Yoakum County (Wasson)—
Argo Oil Corp., Comer 8-A.....1429 5225
Denver Prod. & Ref. Co., Whittenburg 24 ..... 922 5132
Humble, Bennett 13..... 126 5295
Bennett 15 ..... 378 5275
Magnolia, Mahoney 25..... 518 5185
Oil Development Co., Willard 12-763 ..... 557 5270
Shell Oil, Baumgart 11-B.....1325 5182

West Virginia

Boone County—
Columbian Carbon Co., Bull Creek Coal 14 .....¶0.08 1605
Braxton County—
Cameron Prod. Co., Hamric 2..... * 2000
Gilmer County—
Mossor, House 1..... * 1925
McCall Dr. Co., Furr 1..... * 2197
Kanawha County—
Godfrey L. Cabot, McLean Hrs. 7...¶4.0 5174
McLean Hrs. 5.....¶1.2 4996
Putnam Co. 14.....¶0.33 5223
Putnam Co. 15.....¶0.3 5112
Rex O. & G. Co., Gandee 1..... 1 1946
Delmos Hill, Hill 1..... * 2260
Putnam County—
United Fuel Gas, Phelps 5001.....¶8.0 1744
Mabe Gas Co., Mabe & Smith 1....¶0.08 2212
Ritchie County—
Howard Hall, Butcher 5.....¶0.04 & 3 1760
Roane County—
Wolf Camp O. & G., Jones 2.....¶0.05 1687
Charles E. Young, Fields 2.....¶0.25 1438
Wetzel County—
Manuf. Lt. & Ht. Co., Hohman et al 1 .....¶2.82 2983
Blatt 2 ..... * 3100

OLD WELL DEEPENED

Putnam County—
Shafer Gas Co., Hollandsworth 2 (otd 1045) .....¶0.07 2228

Wyoming

Carbon County (Wertz)—
Sinclair-Wyoming Oil, Wertz 15-A, sw sw ne 7-26n-89w.....1680 6103
Niobrara County (Lance Creek)—
Argo Oil, Elliott 15, nw ne sw 5-35n-65w 2400 5366
Ohio Oil, Rohlff 9, c se ne se 32-36n-65w 1340 5385
Park County (Frannie)—
Stanolind, Rosenburg 1, c ne ne ne 26-58n-98w 380 2887

Grant Tinsley Dome Permit On 38 x 155-Foot Tract

The Mississippi State Oil & Gas Board last week granted R. T. Sellers and D. H. Sanford a permit to drill a test on a tract 38 x 125 feet in Section 30-10n-2w, in the Tinsley Dome field, Yazoo County, making an exception to the field's 40-acre spacing rule.

Opponents at a hearing contended the strip was part of a highway right-of-way, and was needed for that use. The board took the position that a decision on that point rested in court action.

Another application by Sellers to drill on a space 5 x 150 feet was withdrawn because description of the land was vague.

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County—Raymond D. Herzog's Marine 29, sec 26-25-18, lcn, Devils Den area. Union Oil Co.'s KCL 31-3, sec 3-30-26, foundation, McClung area. Shell's Smith 77-11, sec 11-26-27, lcn, Richgrove area.

KANSAS
FIRST REPORTS

Barton County—Helmerich & Payne's Wondra 1, sw se nw 10-17-12w, lcn.

Ellsworth County—Republic Nat. Gas Co.'s Radenberg 1, c w½ nw se 8-17-11w, dr.

Elk County—McPherson et al's Clogson 1, sw se se 21-28-11e, dr.

Greenwood County—McPherson et al's Batesman 1, sw se nw 24-28-11e, dr.

Rice County—Wakefield et al's Smyres 1, c n½ ne se 35-19-6w, rur.

Stafford County—Stanolind et al's Nagel 1, c e½ ne sw 3-24-15w, lcn.

COMPLETIONS

Franklin County—Schultz et al's Dafis 1, c s½ sw nw 28-18-18e, 12 mi s Pomona gas pool, Burgess sand 1258 ft, abnd 1260 ft.

Stafford County—Fain Dr. Co. et al's Thole 1, c e½ se se 23-21-12w, 2 mi n Max pool, Topeka 2825 ft, Lansing 3240 ft, Base Kansas City 3495 ft, Cherty Conglomerate 3620 ft, Simpson shale 3551 ft, Arbuckle 3595 ft, perf 48 shots 3593-3607 ft, no show, 1000 gals acid, abnd 3680 ft. Earl Wakefield & Atlantic Ref. Co.'s Prescott 1, c w½ nw sw 32-23-14w, 4½ mi nw Rattlesnake pool, Topeka 3150 ft, Lansing 3614 ft, sso 3809-13 and 3820-24 ft, Base Kansas City 3860 ft, Sooy 3940 ft, Viola 3976 ft, Simpson 3990 ft, Arbuckle 4081 ft, abnd 4091 ft.

NORTH LOUISIANA
FIRST REPORTS

Natchitoches Parish—C. Porter Johnson's Lacaze 1, sec 63-6n-4w, mat.

Sabine Parish—Plubber & McDaniel's Phares 1, nw sw 4-5n-12w, mat.

La Salle Parish—Big West Dr. Co.'s Whatley 1, nw ne ne 25-8n-2e, rig.

COMPLETION

Madison Parish—H. L. Hunt's Lancaster 1, se irreg. sec. 3-14n-12e, abnd 6725 ft.

SOUTH LOUISIANA
FIRST REPORT

Evangeline Parish—Hebert & Smith's Evangeline Land & Min. Co. 1, sec 37-3s-1w, Pine Prairie pros, lcn 9500-ft Wilcox test.

COMPLETIONS

Iberia Parish—Plymouth's Tilly 1, sec 13-12s-10e, new sd in Bayou Pigeon fld, flwg 23 bbl 47-gr oil hrly from 8142-53 ft via 3/16-in ch, tbg press 1050 lbs.

Iberville Parish—Titanic's Natalbany Lumber Co. 1, sec 7-9s-12e, disc St. Gabriel fld, flwg 238 bbl 30.5-gr oil dly via 9/64-in ch from 7766-76 ft, no water, tbg/csg press 2350/2850 lbs.

Terrebonne Parish—Stanolind's Continental Land & Fur Co. 1, sec 34-17s-14e, Lake Piquant pros, abnd 11,010 ft, no shows.

MICHIGAN
FIRST REPORTS

Allegan County—C. G. Stark's Hoag 1, nw se sw 21-1n-15w, rig.

Clare County—Seba O&G Dev. Co.'s Oxendale 1, se ne se 36-18n-5w, mim.

Kalamazoo County—W. S. Cook's Mott 1, sw sw sw 2-1s-12w, mim.

Van Buren County—Calif. Dr. Co.'s Theisen 1, ne sw sw 18-4s-13w, rig.

COMPLETIONS

Allegan County—C. W. Cook's Larson 1, se ne ne 26-3n-14w, Traverse 1455 ft, abnd 1488 ft.

Clare County—Union Dr. & Prod. Co.'s Consumers Power Co. 1, n½ nw nw 16-20n-5w, Dundee 3786 ft, abnd 3811 ft.

Kent County—Clifford Perry's Michigan Trust 1, se ne se 23-5n-12w, Traverse 1695 ft, abnd 1710 ft.

Lenawee County—Voorhees Dr. Co.'s Gillen 1, n½ n½ 12-9s-1e, Traverse 550 ft, Dundee 621 ft, Monroe 710 ft, Sylvania 830 ft, abnd 920 ft.

Manistee County—W. P. Shoemaker's Rogers 1, c s ne se 34-23n-16w, Traverse 865 ft, Dundee 1580 ft, abnd 2588 ft.

Oceana County—Muskegon Dev. Co.'s Sweet 1, ne sw se 23-13n-16w, Traverse 1958 ft, abnd 1975 ft.

MISSOURI
COMPLETION

Atchison County—E. V. Jackson and Fred Rust et al's Hays 1, c ne ne 22-66n-42w, 15 mi nw Rockport, Topeka 277 ft, Mississippi 1546 ft, Hunton 2092 ft, abnd 2192 ft.

NEW MEXICO
COMPLETION

Eddy County—Black & Ratliff's Simmons 1, c se nw 9-21s-25e, elev 3344 ft, abnd 1252 ft.

OKLAHOMA
FIRST REPORTS

Cleveland County—Luther Mayes et al's McCommins 1, nw ne ne 15-10n-1e, cellar.

Creek County—L. B. Jackson's Prince 1, sec ne 26-19n-9e, dr.

Pottawatomie County—Hall-Jordan Oil Co.'s Whitehead 1, c w½ se sw 36-10n-3e, lcn.

Seminole County—Mico O. & G. Co.'s Davis 1 nec 33-10n-8e, rur. Seiboldt Dr. Co.'s Boren 1, sw se sw 34-6n-6e, rur.

COMPLETIONS

Carter County—Franklin Pet. Corp.'s Rittenhouse 1, se ne se 5-4s-2w, 2 mi nw Hewitt pool, abnd 3009 ft in shale.

Hughes County—Mid-Continent et al's Davis 1, sec nw 15-6n-8e, s of Sasakwa pool, Senora lime 1150 ft, Senora sand 1170 ft, sand 2110-60 ft, Brown lime 2420 ft, Booch 2588 ft, Glcrease 2842 ft, Wapanucka 3120 feet, Second Wapanucka 3315 ft, Sandy Wapanucka 3330 ft, abnd 3390 ft.

Jackson County—G. R. Burke et al's Estes 1, swc ne 34-3n-19w, 7 mi ne Altus pool, top Granite 1065 ft, abnd 1125 ft.

Kay County—Earl Williams et al's Trueblood 1-A, sw ne se se 25-25n-1w, n of Tonkawa pool, abnd 2424 ft.

Lincoln County—Mid-Continent et al's School Land 1, nw ne nw 36-12n-3e, 2 mi s abnd Meeker pool, Prue 4320 ft, sso, Vertigris 4408 ft, Cherokee Brown lime 4750 ft, Brown lime 4885 ft, Caney 4960 ft, Mayes 5060 ft, Woodford 5250 ft, Hunton lime absent, Viola 5447 ft, Dense 5485 ft, Dolomite 5495 ft, abnd 5534 ft.

Pontotoc County—Alma Oil Co.'s Norris 1, ne nw sw 22-4n-4e, 4 mi sw Beebe pool, sands 800-910, 1100-20, 1240-50, 1320-40, and 1490-1500 ft, Hunton absent, Trenton 1500 ft, Bromide 1575 ft, Oil Creek 2460 ft, Arbuckle 2750 ft, abnd 2978 ft.

Pottawatomie County—Kerlyn Oil Co.'s Cherry 1, se ne nw 32-8n-5e, northeast extension for St. Louis pool, top Senora zone 3560 ft, sand 3590-3615 ft, so, Mayes 3885 ft, Woodford 3968 ft, Hunton 4090 ft, Sylvan 4110 ft, Viola 4195 ft, Dense 4240 ft, Dolomite 4290 ft, td 4330 ft, pb 4325 ft, 1000 gals acid, 77 bbls 40.7 gravity.

Roger Mills County—Willie Anderson et al's Purcell 1, c nw se 9-13n-26w, 2 mi nw Rankin, abnd 60 ft.

SOUTH TEXAS
FIRST REPORTS

Aransas County—Humble's Aransas Bay-State 1, state tr 246, Aransas Bay, on small island, 4.9 mi ne Aransas Pass, 9500-ft test, company rig, lcn.

Bee County—James R. Dougherty's Hicks 7, 1120-ac tr, Jose Maria Uranga gr, 3 mi sw Normana, 10¾-in csg 310 ft, drill-stem test 4170-78 ft, rec 20 ft oil, 80 ft oily mud, 220 lbs pressure, ¼- & ⅝-in chokes, 10 minutes, crg ahead.

Bexar County—C. A. Smith's Schuwirth 2, 200-ac lse, A. de la Garza gr, 12 mi s San Antonio, lcn.

Duval County—Hiawatha's Parr 30, 3920-ac lse, San Andres gr, 2000 ft e of N Sweden prod, 6000-ft test, Stice Dr. Co., cont, dr 1775 ft. Sun's Black 1, James House sur, 867-ac tr, 3 mi ne Fitzsimmons fld, 4500-ft test, company rig.

Frio County—Meyer Lipton's McKinley 1, 177.66-ac lse, BS&F sur 5 at Melon townsite, 8 mi s Pearsall, 1000-ft test, lcn.

Jim Hogg County—Sal Vieja's J. Vela Pena & Bros. 1, blk 45, J. Keoughan, Keoughan subd, sh 4, El Peyote gr, 534.37-ac lse, 1½ mi ne Patal fld, 12 mi sw Hebbronville, 3200-ft test, lcn dropped, taken over by J. Vela Pena & Bros. Achning & Daubert's Garza Est. 1, blk 7, S.F.A. Mfg. & Irr. Co. sur 145, 6 mi s Petroleum, e Alworth fld, lcn.

Jim Wells County—J. H. Dunn's Kranicky 1, 100-ac lse, G.H.&H. sur 111, 3 mi se Orange Grove, 5500-ft test, elev 165 ft, lcn.

Nueces County—Texas Conservative's Schubert 1, e¼ s½, sec 130, Geo. H. Paul's subd. Robt. Driscoll rch, mi se S Clara Driscoll fld, 7000-ft test, lcn. Shasta's Blucher Est. 1, 500-ac lse, out of e porc of C. F. H. Von Blucher 1248.8-ac tr, 2 mi se Banquette, 7500-ft test, elev 78 ft, lcn.

Webb County—W. C. McBride, Inc.'s Adami 1, 140-ac lse, sur 5, 25 mi nw Freer, 1250-ft test, elev 350 ft, lcn.

COMPLETIONS

Duval County—Graham Bros.' Holzapfel 1, sur 178, 40-ac lse, 1320 ft n Giblin Holzapfel 1, abnd 1300 ft. Wilcox O&G Co. and Henderson Coquat's Garcia 1, 1135-ac tr, 7500 ft se Chiltipin fld, abnd 5518 ft.

Nueces County—Stanolind's Shaffer 1, 271-ac tr, lot 7, blk 4, Mary Luby subd, 1½ mi w Luby fld, abnd 7483 ft.

Webb County—J. M. Anderson's Benavides 1, 320-ac lse, w½ sur 713, abnd 3407 ft.

Williamson County—R. Clark's Freels 1, 91-ac tr, Hamilton White sur, Byersville outpost, abnd 1151 ft.

Zapata County—Jose Martinez's Volpe Bros. 1, sh 31, porc 16, 200-ac lse, 12 mi sw Lopena, abnd 1005 ft.

NORTH TEXAS
FIRST REPORTS

Clay County—Ted Norwood et al's Bentley 1, sec of n 60-ac tr, blk 51, Specht-McCutchin sur, lcn. L. W. Stanford et al's Edrington 1-A, F. W. Grassmeyer sur, lcn.

Cooke County—Texas Co.'s Bindle 1, F. Hughes sur A-439, mim.

Montague County—Benson & Benson's Wilmer Seay 1, se H&TC sec 31, blk 4, but in J. P. Owensby sur, lcn.

Young County—L. T. Burns et al's Larimore 1-A, nwc of e 200 ac TE&L sec 150, lcn Ellenberger test.

COMPLETIONS

Archer County—Adams O&G Co.'s Powell 1, sec S. P. Ry. blk 14, sec 1, Bunger 1744 ft, Home Creek 2045 ft, Bend 4987 ft, abnd 5261 ft. Fish & Fish's Prideaux 1, sec TE&L sec 1867, abnd 852 ft. Shappell Oil Co.'s Lyles 15, nec nw Hooper-Wade sec 7, Bend 4830 ft, abnd 4875 ft. H. F. Smiley et al's Tarr 1, sec 136, H. S. of C. R. sur, abnd 1400 ft. Underwood Dr. Co.'s Kunkel 1, blk 12, Crawford Pasture subd, abnd 1289 ft.

Baylor County—British-American O. P. Co.'s Cowan 1, sec se T&NO sec 102, A-1311, Canyon 2537 ft, 2500 gals acid 2537-42 ft, td 2547 ft, pump 58 bbls oil and 500 bbls water, new pool.

Cooke County—Bridwell Oil Co.'s Fisher

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1-A, nw se blk 11, John Barnett sur, Ellenberger 1984 ft, abnd 2013 ft.

Montague County—United Producers & Continental's Custers 2-B, 71.2-ac lse, Jas. McKnight sur, new shallow pay, pb fr granite 3589-3612 ft to 2995 ft, cem 7-in 2958 ft, perf 24 shots 2282-90 ft, flowed 81 bbls 39-gr oil 3 hrs ½-in ch. J. G. Hammond, Inc.'s Jester 1, east cor 84½-ac tr, E. Wingate sur, 1½ mi nw Mallard, Bend 6282 ft, Barnett shale 6850 ft, Mississippian 7164 ft, abnd 7176 ft.

Young County—L. T. Burns et al's Bloodworth 1, TE&L sec 214, abnd 903 ft.

WEST TEXAS

FIRST REPORT

Pecos County—M. D. O'Quinn et al's McNeal 2, H&GN sec 74, blk 10, lcn Ellenberger test.

COMPLETIONS

Crockett County—E. M. Wahlenmaier-Steve Currie et al's Bean 1-A, c sw ne GC&SF sec 48, blk UV, elev 2512 ft, first hole jkd 670 ft, skid 20 ft, used 1000 gals acid 1451-56, flowed 196 bbls oil, plus 5 percent bs&w, in 22 hrs via gas lift, new pool.

Ector County—Stanolind's Cowden 1-B, c se sw T&P sec 12, blk 44, T-1-N, elev 3110 ft, Yates 2800 ft, brown lime 3710 ft, solid lime 3855 ft, Clear Fork 5190 ft, abnd 7000 ft.

Howard County—Cosden Pet. Corp.'s Fee 1, nec T&P sec 47, blk 32, T-1-N, elev 2469 ft, missed high pressure air zone, abnd 1507 ft.

EAST TEXAS

FIRST REPORTS

Lamar County—C. W. Whitehead & Dahl Bros.' Barr 1, near nec of Isreal sur, but in I. P. Langston sur, 1 mi s Bairdstown, dk.

Robertson County—Cosmos C. Baker & Son's Middleton 1, se part 84.33-ac lse out of 168-ac tr, J. S. McNeil sur, 2 mi s Elliott, sp & sd.

Rusk County—Al H. Bedinghaus et al's McCreary 1, 265-ac tr, Maria Huejas sur, 8 mi sw Mount Enterprise, mim for deep test.

COMPLETIONS

Bowie County—A. L. Willis & Son's Taylor 1, nec of 100-ac tr, J. McClure sur, elev 294 ft, Pecan chalk 1639-2125 ft, Blossom 2490 ft, Georgetown 3176 ft, Fredericksburg 3398-3512 ft, Paluxy 3625 ft, abnd 4002 ft.

Trinity County—R. W. Burnett et al's Southern Pine Lumber Co. 1, sw part 142-ac tr, G. Ricardo sur, 2 mi n Apple, elev 208 ft, Wilcox series 1554-70 ft, abnd 2567 ft.

WEST CENTRAL TEXAS

FIRST REPORTS

Brown County—Manning-Richburg & Johnson's Charter 3, sw nw BBB&C Ry. sec 19, blk 2, lcn.

Callahan County—Ungren-Frazier et al's Rushing 1, swc BBB&C Ry. sec 116, lcn.

Jones County—Fain-McGaha Oil Corp.'s Cooper 1, se se sw T&P sec 29, blk 15, lcn for 4000-ft test.

Shackelford County—J. F. Baker & M. E. Daniel's Davis 1, sec nw T&P sec 3, blk 13, lcn. B. & F. Bonded Cotton Warehouse Co.'s Snyder 1, ne sw ne L. A. L. sec 32, lcn. R. H. Roark et al's Elliott 1, nec of south 120 ac of e½ L. A. L. sec 12, lcn.

COMPLETIONS

Callahan County—B. C. Mann et al's Windham 1, sw nw se GH&H Ry. sec 154, blk 3, abnd 1522 ft.

Jones County—Shaheen Oil Co.'s Young 1-a, nec of 120-ac lse, S. Andrews sur 191, abnd 2261 ft.

Shackelford County—C. V. Welch et al's Baker 1, Wm. Watson sur, abnd 1648 ft.

Taylor County—J. B. Robertson-Jim Dunigan's Cresswell-Shell 1, sec sw¼ sec 391, Geo. Hancock sur, abnd 3877 ft.

TEXAS GULF COAST

FIRST REPORTS

Brazoria County—Burch Spears' Dannenbaum et al 1, H. Austin sur, ¾ mi s of sw flank prod, Danbury dome, el 28 ft, lcn 1400-ft test. Pure and Gulf's Greenameyer 1, J. E. B. Austin sur, n shore Manor Lake, el 38 ft, wtg on rig for 9500-ft Frio test.

Wharton County—Texas Progress' Sedlack 1, WCRR sur A-485, Glen Flora area, prep spud 6000-ft test.

COMPLETIONS

Brazoria County—Strake's Griffith 1, H. P. Cayce sur, 3 mi sw Alta Loma fld, disc new fld named Hall's Bayou, flwd 164 bbl 49-gr oil dly 5/32-in ch, from Frio open hole 10,-325-333 ft, tbg press 2250 lbs. F. W. Zelcer's Investment Securities 1, Chas. Garrett sur, Pledger area, Discorbis 6860 ft, no shows, abnd 8000 ft.

Harris County—H. C. Cockburn-Jack Frazier-Temple Hargrove's Meyer 1, Reuben White sur, Sheldon area, abnd 5511 ft.

Matagorda County—Cities Service's Duffy 1, J. W. E. Wallace sur, 3 mi n Blessing fld, Heterostegina 6248 ft, Marginulina 6343 ft, abnd 9211 ft Frio.

Montgomery County—Superior Oil Co. of Calif.'s McWhorter 1, T. J. Nichols sur, 7 mi e Magnolia, disc new fld named Lake Creek, flwg 130 bbl 60-gr dist 15 hrs via 12/64-in ch from Wilcox 9212-17 ft, tbg press 1800 lbs, 2 percent sw.

Waller County—J. G. Mayo-T. A. Carlton's Donnigan 1, Wm. Cooper sur, e flank San Felipe dome, abnd 8010 ft.

Texas Hearings

The Texas Railroad Commission has scheduled the following hearings:

March 7, to determine the proper allowable for the Talco field, Titus and Franklin counties; to determine the proper allowable for the Cayuga field, Anderson and Henderson counties.

March 10, application of Sun Oil Company for a dual completion in the Chapel Hill field, Smith County; special operating rules for the Conoco-Driscoll field, Duval County; revision of the method of allocation in the Wade City field, Jim Wells County.

March 11, revision of the spacing rule in the Waddell field, Crane County; dual completions in the West Ranch field, Jackson County.

March 12, application for an allowable increase in the Wortham field, Freestone County; regulation of cycling operations in the Stratton field, Nueces County, postponed from March 3; regulation of cycling operations in the Agua Dulce field, Nueces County; revision of rules governing proration units and casing program in the Sand Hills (Permian) field, Crane County.

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MEN IN THE INDUSTRY'S NEWS

FRED R. SCHROEDER has been named superintendent of the geological department of Union Producing Company, Shreveport. A graduate of the University of Illinois, he joined the company in 1930 as a geological scout. He worked in this capacity in the East Texas field during its boom years, 1930 through 1934, when he was transferred to Shreveport. In 1937, he was transferred to the general offices in Houston, returning to Shreveport in February, 1940, when the general offices of United Gas Pipe Line Company and its associated companies were moved there.

J. BEN CARSEY, division geologist for Humble Oil & Refining Company at Midland, Texas, has been transferred to Lake Charles to serve as Lounsiana Division geologist.

Vaughn C. Maley, stationed at Hattiesburg, Mississippi, as district geologist, will succeed Carsey at West Texas, while E. A. Murchison, Jr., until recently office geologist at Houston, will succeed Maley at Hattiesburg.

FRANK R. DENTON, East Texas district geologist for Stanolind Oil & Gas Company, and R. M. Trowbridge, East Texas district stratigrapher for Shell Oil Company, have resigned their positions to enter into a general consulting partnership with headquarters at 225 Owen Building, Tyler, Texas.

RUSSELL B. BROWN, counsel for the Independent Petroleum Association of America, last week discussed "The National Picture as It Represents the Oil Industry" before a dinner meeting of oil men and civic leaders of Kentucky, Illinois and Indiana, held at Evansville.

JOSEPH WILSON, Salt Dome Oil Corporation, Dallas, will address the Houston Geological Society at regular weekly luncheon March 6, at the Texas State Hotel, on "Geology of the South Cotton Lake Field, Chambers County."

ERNEST C. LOW has been appointed general manager of sales for John A. Roebling's Sons Company, Trenton, New Jersey. He has been identified with the company for 32 years. On graduation from college in 1909, he joined the California division at Los Angeles, serving in various sales capacities. He was appointed manager of the San Francisco branch in May, 1930, and on January 1, 1940, was elected president and general manager of John A. Roebling's Sons Company of California. He will make his headquarters at Trenton.

S. MERTON McMAHON has become associated with Pittsburgh Steel Company, as salesman for oil country tubular goods in Eastern states. He was several years associated with The National Supply Company in Ohio and Illinois, and later with Continental Supply Company in Texas. His headquarters will be in Pittsburgh.

W. H. WOMACK, who for 20 years has been connected with the production and oil equipment sales departments of the J. B. Beaird Corporation, Shreveport, has been appointed a director of the National Rifle Association. As a marksman, Womack's honors have included presidency of the Louisiana State Rifle Association, Louisiana and Texas championships, and coach for the Dewar International Rifle Team at Camp Perry in 1940.

WILLIAM N. FINNEGAN, JR., assistant to the president of Humble Oil & Refining Company, Houston, has resigned to enter into the business of trading in oil properties. He joined the company in 1919, and two years ago received his 20-year service award. Finnegan plans to open an office this month in the Esperson Building, Houston.

L. F. LIVINGSTON, manager of the Agricultural Extension Division of E. I. du Pont de Nemours and Company, will address the Illinois Basin Chapter of the American Petroleum Institute's Division of Production March 7 at the Paradise Club, Mount Vernon, Illinois.

R. A. WEIKEL, Brown Instrument Company, Philadelphia, discussed "Training Instrument Men for Industry" before a luncheon meeting of the Houston Engineers Club last week. At an evening session he spoke on "Flow Meters," illustrating his discussion with motion pictures.

JOHN GATES, assistant manager of Tropical Oil Company at El Centro, Colombia, is in the United States on vacation.

FRED T. MANLEY, 60, retired vice president of The Texas Company, died February 25 in Miami, Florida. He entered the oil business 38 years ago as a field laborer for the company at Spindletop. A year later he was transferred to Port Arthur to aid in construction of a refinery, and later became manager of the refinery division of the company. He spent 14 years with the company at Port Arthur, 12 years at Houston, and then moved to New York. He retired a year ago. He was co-discoverer of the Holmes-Manley cracking process.

K. B. WINSTEAD, sales manager of the Midwest Division of Oil Well Supply Company for the last two years, has been appointed assistant to the vice president, Midwest Division, with headquarters at Dallas. Winstead's connection with the company dates from 1921, when he became associated with the company's Fort Worth office. Subsequently, he served as store manager at Breckenridge, manager of the North Texas District, and sales manager of the East Texas, North Louisiana and Arkansas District.

JOHN D. GILL, director of The Atlantic Refining Company, Philadelphia; H. A. Metzger, Standard Oil Company of New Jersey, New York, and Gustav Egloff, Universal Oil Products Company, Chicago, will be among a group of United States research, industrial and banking executives who this month will make a tour of principal South American nations under auspices of the National Research Council.

DR. H. KAVALER, of the research department of Phillips Petroleum Company, Bartlesville, addressed the Shreveport Geological Society last week, stressing the importance of detailed geological and engineering studies of oil reservoirs. He outlined various methods of estimating reserves.

WILL OHLHAUSEN, 43, producer of McCamey, Texas, died February 26 in a Fort Worth hospital after a brief illness. He was a former employe of Continental Oil Company.

ALBERT P. GROEBL, West Texas oil man and a resident of Big Spring, has been elected to the board of directors of the Cosden Petroleum Corporation.

MARION W. PICKELL, paint and varnish chemist for General Paint Company, Tulsa, was ordered to active duty with 368 Infantry on March 2 at Fort Hauchuca, Arizona. He is a first lieutenant.

GAGE LUND, assistant manager of The California Company and Standard Oil Company of Texas, last week was elected president of The California Company. After attending the University of Montana and Leland Stanford University, he worked in the geological department of Northern Pacific Railroad in 1924-25. He was employed by Standard Oil Company of California in May, 1925, and since that date has been in the geological and pro-

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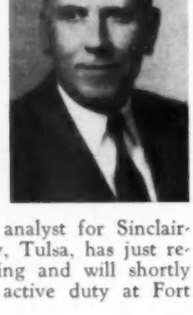
MEN IN THE INDUSTRY'S NEWS

ducing departments of the company and its subsidiaries.

Other officers named were H. D. Collier, board chairman; H. F. Davies and J. H. Payne, vice presidents, and H. C. Teasdel, secretary and treasurer. Directors, in addition to the officers, include C. V. Porter.

GUY WARREN, interested in a number of recycling projects along the South Texas Gulf Coast, has been elected as a member of the board of directors of the Corpus Christi Chamber of Commerce.

HAROLD C. EDDY has been named general manager of Petroleum Rectifying Company of California. A graduate of Colorado School of Mines, he has been with the company for 27 years. For the past several years he has been actively engaged in developing the company's electrical desalting process.



JACK TURNER, gas analyst for Sinclair-Prairie Oil Company, Tulsa, has just returned from Wyoming and will shortly report for a year's active duty at Fort Knox, Kentucky.

BOB BARKER, production engineer trainee for Shell Oil Company, has been transferred from Stroud, Oklahoma, to Tulsa.

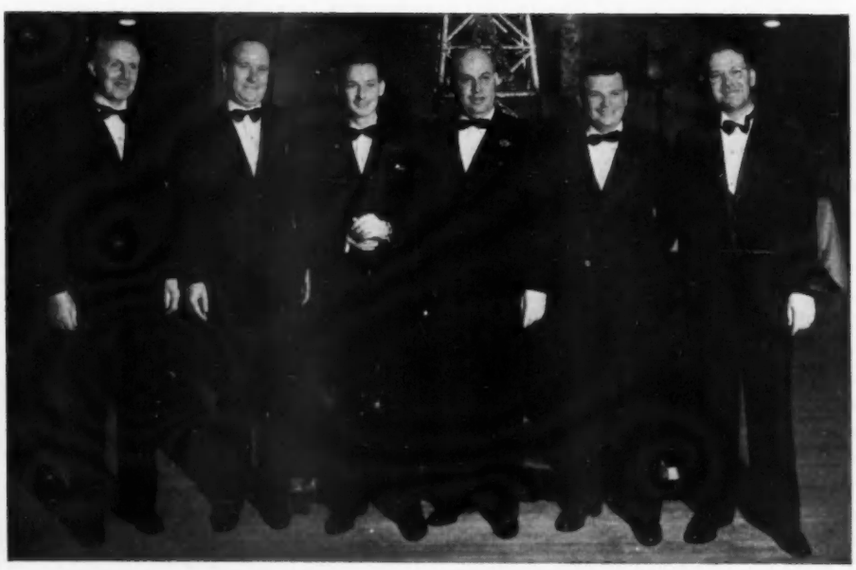
HAROLD E. COOPER addressed the Tulsa Chapter of Nomads February 17. He recently returned from a nine-month tour of South American oil fields.

ALLAN S. HICKS, manager of export sales for Hydril Company, has taken over the additional duties of California sales manager. He will make his headquarters at the company's factory at Lomita, California. Hicks has been with the company more than 10 years, and during the period served as field engineer in California, Texas and Oklahoma. Two years ago he took a trip in the Near East, Burma and Netherland East Indies, and a year ago toured South American fields.

EDWIN R. PERRY, 69, Tulsa operator and former vice president of Cosden Company, predecessor of Mid-Continent Petroleum Corporation, died February 16 following a lengthy illness. A native of Ontario, Canada, Perry graduated from Northwestern University and received his law degree from Harvard law school. He came to Tulsa in 1905 where he practiced law before joining the Cosden Company.

PAUL M. LEWIS has been named district manager of a new office established at Brownfield, Texas, by International Cementers, Inc.

WARREN SMITH, vice president of Pantepec Oil Company, plans to leave New York this week for Caracas, Venezuela, his headquarters. He will be in Venezuela for about six months.



New officers of the Los Angeles chapter of Nomads, pictured during the group's second annual inaugural dinner dance last month, are, left to right, Earl M. Rees, Oil Well Manufacturing Company, secretary-treasurer; R. J. Eiche, sergeant-at-arms; W. F. Bettis, M. O. Johnston Oil Field Service Corporation, vice president; E. B. Fowks, Emsco Derrick & Equipment Company, president; Elmer R. Smith, Lane-Wells Company, assistant secretary treasurer, and Roy Hitchcock, H. & B. Sales Company, deputy sergeant-at-arms.

MEN IN THE INDUSTRY'S NEWS

S. A. SCHERBATSKOY, for the past five years director of research for Engineering Laboratories, Inc., and in charge of instrument research for Seismograph Service Corporation, has been elected vice president of Well Surveys, Inc., Tulsa. Before his connection with the oil industry, he was engaged in research and development work for Bell Telephone Laboratories. He graduated from the University of Paris in 1929, specializing in physics.

H. F. SINCLAIR, chairman of the executive committee of Consolidated Oil Corporation, sailed from New York February 22 for Venezuela, where he and others in his party will look over the properties of Venezuelan Petroleum Company (Compania Consolidada de Petroleo) and inspect the company's wildcat well in the Maturin district. Among those in the party were E. W. Sinclair, chairman of the finance committee of Consolidated Oil Corporation; A. E. Watts, chairman of the board of Venezuelan Petroleum Company and D. T. Pierce, assistant to H. F. Sinclair.

A few days prior to their sailing, H. R. Kunhardt, president of Venezuelan Petroleum Company, also left New York to inspect the new producer, the first his company has developed in Venezuela. The party will be in Venezuela for several weeks.

JOHN T. RYAN, 57, president of Mine Safety Appliances Company, Pittsburgh, died February 20 in Miami, Florida. A native of Huntingdon County, Pennsylvania, he attended Juniata College and Pennsylvania State College, from which he graduated in 1908 with a B.S. degree in mining engineering. In 1934, he was given the degree of honorary engineer of mines by the same institution. After graduation he became affiliated with Rocky Ridge Coal Company, and later was superintendent and mining engineer for Langdon Coal Company, Huntingdon, Pennsylvania. From 1911 to 1914, he was in charge of mine rescue and safety, and the mine lamp testing division of the United States Bureau of Mines. In 1914, he and George H. Deike, Pittsburgh, founded Mine Safety Appliances Company.

JOHN BARNESON, founder of General Petroleum Corporation, died at his home in Hillsborough, near San Francisco, last week. One of the early pioneers in the development of the oil industry on the Pacific Coast, Barneson undertook the first major pipe line construction program in California when he built a line connecting the Coalinga field with tidewater at Monterey. He also pioneered in use of fuel oil in maritime commerce when he induced the late Captain William Matson to try the fuel on his ships operating between San Francisco and Honolulu. General Petroleum Corporation, whose predecessor company was Esperanza Consolidated Oil Company, which Barneson founded, was sold to Standard Oil Company of New York in 1926. Barneson served as a vice president of that company until his retirement in 1928.

H. H. TINCH, Westcott Valve Company, Houston, discussed "Developments and Correct Applications of Valves" recently before the Louisiana State University student chapter of the American Institute of Mining & Metallurgical Engineers.

BURT MARTIN, chief gauging and tank strapping engineer for Stanolind Pipe Line Company, Tulsa, last week discussed "Basic Principles of Oil Purchasing" before the Seminole Chapter of the American Petroleum Institute's Division of Production.

SETH KLEIN, for the past eight years sales manager of the Detroit Gear & Machine Division of Borg-Warner Corporation, Detroit, has been named assistant to Bert Dingley, vice president of Marmon-Herrington Company, Indianapolis. He started his career in the automotive field as purchasing agent of Cole Motor Car Company in 1912, and for 19 years was associated with The Fedders Manufacturing Company.

ADDISON C. ARMSTRONG has joined Worthington Pump & Machinery Corporation as manager of the Ordnance division of its works at Holyoke, Massa-

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chusetts. He was formerly affiliated with Truscon Steel Company as a departmental manager, and previous to that was associated with Bartlett-Hayward Company and Campbell Metal Window Corporation.

CHARLES LEHRER has joined Tide Water Associated Oil Company as scout in the West Texas-New Mexico district, with headquarters at Midland. He was formerly with Forest Development Corporation.

CARL S. BEAVERS, 35, traveling auditor for The Texas Company, died February 15 at a Fort Worth hospital following a brief illness. He was a native of Hillsboro, Texas.

G. M. BUTTERWORTH, of the foreign department of Standard Oil Company of California, in January visited a well being drilled at Morere, New Zealand, in which the company is reported to have an interest. He was accompanied by Bert Brush.

KENT RIDLEY, JR., land department of Shell Oil Company, has been transferred from Shreveport to San Antonio, reporting to H. F. Sartwell, district manager.

FRED C. McCULLOUGH, engineer for Geophysical Research Corporation, Tulsa, reported to Oklahoma City March 1 for a year's active duty in the Army.

M. M. WARDEN, Hughes Tool Company, has been transferred to Mt. Pleasant, Michigan, from Salem, Illinois. He replaces H. B. Short, transferred to Illinois, who has been the company's Michigan representative since early last year.

RAY L. ROUNTREE, United Gas Pipe Line Company, Shreveport, and G. W. McCullough, Phillips Petroleum Company, Bartlesville, are chairmen of the general and program committees, respectively, handling arrangements for the seventeenth annual Southwestern Gas Measurement Short Course, to be held at the University of Oklahoma, Norman, April 15-17. Plans for the short course were completed at a meeting of committees last week, and they will be presented for final approval of the general committee at a meeting to be held in Tulsa, March 10.

Chairmen of other committees are: W. H. Carson, dean, College of Engineering, University of Oklahoma, local arrangements, banquet and entertainment; Earl Kightlinger, Arkansas Louisiana Gas Company, Shreveport, publications; C. A. Gibson, Cities Service Gas Company, Bartlesville, exhibits; R. M. Scofield, Lone Star Gas Company, Dallas, study of practical methods; and Miss Kate A. Niblack, Oklahoma Utilities Association, Oklahoma City, registration and publicity.

WILLIAM W. CRAWFORD, president of The Edward Valve & Manufacturing Company, East Chicago, Indiana, died in Miami Beach, Florida, February 19, 1941. He was born in Washington, Connecticut in 1882, and attended Beloit and Oberlin colleges. He started his business career as newspaperman in El Paso, Texas, in 1905, joined the staff of the Chicago Record Herald in 1906, was appointed manager of the Chicago Automobile Club in 1907, entered traction business as secretary-treasurer of the Chicago City and Connecting Railways from 1910 to 1920, was secretary-treasurer and director of the Chicago Interurban Traction Company from 1912 to 1928, and receiver for the same organization 1922 to 1928. He was president of McClellan Refrigerating Company from 1921 to 1928, and president of The Edward Valve & Manufacturing Company since 1923.

T. B. HOFFER, operator, has moved his headquarters from McAllen to the First State Bank & Trust Company Building in Mission, Texas.

W. C. TROUT, Lufkin Foundry & Machine Company, has been named regional vice president of the National Association of Manufacturers.

FRANK MacKAY has resigned as vice president of Superior Oil Corporation, effective March 1, 1941, and will open his own office in Tulsa on April 1.

JAS. B. HUGHES, for two years in charge of field service for Hydril Company at Odessa, Texas, and recently field engineer in the Bakersfield area of California, has assumed new duties as district engineer with headquarters in Houston. His territory will include Texas and Louisiana.

It's a Fact — Johnston

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Squeaks from the Bull Wheel

County Billiards

A traveling salesman, detained in a certain village overnight, was introduced in the hotel to a little billiard table and a set of balls of a uniform, dirty-gray color.

"But how do you tell the red from the white?" he asked.

"Oh," replied the landlord, "you soon get to know them by their shape."

Tempus Fugit

"What causes the flight of time?"

"It's probably urged on by the spur of the moment."

Double Talk

Down South a colored mammy was buying eggs in a store run by a negro.

"Is dese aigs fresh?" she asked. The salesman replied, "I'se not sayin' dat dey ain't."

To which she countered, "I ain't askin' ye ain't dey ain't, I'se askin' ye is dey is?"

War Games

"Private, didn't you realize you were exposing yourself to an imaginary enemy only 250 yards away?"

"That's all right, Sergeant, I was standing behind an imaginary rock 25 feet high."

Dastardly Threat

A man who had been having his laundry done by a neighborhood washwoman had let his account with her run for months. Last week he found the following note in his laundry:

"Dear Sir: You have owed me six dollars now for four months. If you do not pay the whole by next week, I will put too much starch in your collars. Cordially, Mrs. Smith."

Airish

First Hobo (sleeping in a haystack)—"Hi sy, Hopkins, do I feel a draft?"

Second Hobo—"A thousand pardons, me lord. I must have left the pasture gate open."

Baby's Bank

Mary's mother suddenly heard frantic meows coming from the garden, and rushed out to find her daughter holding the kitten by his tail.

"Mary," she cried, "put down that kitten at once! Whatever are you doing to the kitten?"

"Well, mother, dear, I didn't mean to harm him, but last night when father was playing cards I heard him say that there was three dollars in the kitty, and I was trying to shake it out."

Highland Playboys

MacGregor and MacPherson decided to become teetotalers, but MacGregor thought it would be best if they had one bottle of whisky to put in the cupboard in case of illness.

After three days MacPherson could bear it no longer and said: "MacGregor, ah'm not verra weel."

"Too late, MacPherson, ah was verra sick m'sel' all day yesterday."

Preserved

"For a spinster of 40, she is a remarkably well preserved woman, don't you think?"

"Well, she ought to be—she got pickled last night and canned this morning."

Bet He Didn't

"Why is Francis Scott Key so famous?"

"Because he knew all the verses of the 'Star Spangled Banner.'"

Easy to Find

Small Boy—Gee, Dad, there's an auto accident. I want to see it.

Dad—Oh, come on, I'll let you see one in the next block.

Not the Word for It

"How do you like your new boss, Mayme?"

"Oh, he ain't so bad, Lil, only he's kinda bigoted."

"Whadda y'mean, bigoted?"

"Well, he thinks words can only be spelled one way."

Chummy Roadster

"How many will this car hold?"

"Three, but six can get in if they're well acquainted."

Easy

"Now, how would you close your books?" asked the teacher of his business training class.

"Oh, that's simple," replied the coed, as fitting her words to action, she closed them with a bang.

Sample

"Shine your shoes, Mister?"

"No time, Sonny."

"Well, to start the day right I'll do one for nothing."

"All right, go ahead."

"There, how does she look, Boss?"

"Fine."

"Well, for 10 cents I'll do the other one."

Results Dubious

"Did Mr. Borer sing a popular song at the concert?"

"Well, it had been popular before he sang it."

No Bluffing Necessary

"Now that you're a success as a character actor and are going to be married, will you build your house on a bluff?"

"I should say not—her father's paying for it."

Some Rest

Did you sleep well on your cot? I'm afraid it was a little hard and uneven, but—

It was all right, sir. I got up now and then during the night and rested a little, you know.

Ages

"Have you any children?"

"Yas, sah, Ah's got foah."

"How old are they?"

"Well, now let's see—Ah's got one lap child, one creeper, one porch chile, and one yard young'un."

The Price of Peace

Over the counter of the pawnshop a musician handed his violin with the brief comment:

"How much?"

The proprietor examined the instrument and then replied:

"Five dollars."

"That's ridiculous! Why, the neighbors offered me more than that!"

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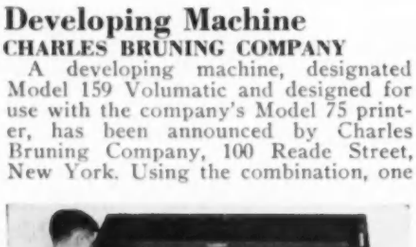
KEEP PURE DRINKING WATER ALWAYS HANDY

NOTES FOR THE Equipment Buyer and User

Developing Machine

CHARLES BRUNING COMPANY

A developing machine, designated Model 159 Volumatic and designed for use with the company's Model 75 printer, has been announced by Charles Bruning Company, 100 Reade Street, New York. Using the combination, one



Bruning's Volumatic Developer

operator can perform the entire printing and developing process.

In operation of the developer, sensitized paper and tracings are fed into the machine at the front, where they are immediately exposed to the printer section. A vacuum separator roll at the discharge point of the printer separates the tracings from the exposed prints, allowing the prints to pass automatically to the developing and drying sections. The tracing is returned to the operator, while the developed print is delivered flat and dry at the rear of the machine.

The developer consists of a separator roll, water roll, and a series of bands that carry the developed prints through the drying section. The developing section is driven by the printer, and is synchronized to operate at the same printing speeds, with a range to 25 feet per minute.

Pipe Couplings

Pittsburgh Pipe & Coupling Company, Allison Park, Pennsylvania, has issued Catalog 41, 48 pages illustrating various couplings. Tables of sizes, weights and dimensions are given on each type, and also sectional drawings. Engineering data includes thread standards, thread dimensions, tapping and recommended threading practice. Included is a series of factory views showing manufacture of Anvil forged seamless steel couplings.

Equipment

Caterpillar Tractor Company, Peoria, Illinois, has issued a 36-page two-color catalog, listing more than 50 products manufactured by the company. Sections of the booklet are devoted to track-type tractors, road machinery, diesel and natural gas engines, diesel marine engines, diesel automotive engines, and diesel and natural gas electric sets. Each of the products is illustrated, and brief specifications given. It is designated Form 6425.

Screen Conditioning

M. M. KINLEY COMPANY

A method of reconditioning oil well screens, employing a series of explosive charges in individually spaced bakelite and aluminum shells, has been announced by M. M. Kinley Company, 301 Adams Street, Houston.

The shot is designed to force the screen wrapping away from the original perforations to provide an opening without damaging the pipe. The shot may be confined to any desired portion of the liner.

Traveling Block

THE INTERNATIONAL DERRICK & EQUIPMENT COMPANY

A traveling block designed for drilling to depths in excess of 15,000 feet, designated Ideco giant traveling block, has been announced by The International Derrick & Equipment Company, Beaumont, Texas.

The block employs five 48-inch individually lubricated sheaves, mounted in heavy-duty bearings. They are of chrome-nickel, chrome-nickel Hi-temper groove or manganese steel, and are interchangeable with sheaves of the company's Ideco giant crown block.

The traveling block is of the overbalanced type, proportioned to prevent overturning and fouling of the lines when the block is lowered.

Ideco Giant Traveling Block

Reducing Elbow

MIDWEST PIPING & SUPPLY COMPANY

A reducing butt-welding elbow, designed for use where it is necessary to change both direction and pipe size, has been announced by Midwest Piping & Supply Company, 1450 South Second Street, St. Louis.

The wrought steel of the elbow is worked in compression, rather than be-

Midwest's Reducing Elbow

ing extruded or stretched, and is stress relieved after forming, welding and compression-sizing operations. Ends are machine faced and beveled. The elbow is made in 33 regular sizes, ranging from 2 x 1 to 12 x 6 inches. It is made of other materials on special order.

Paint

THE B. F. GOODRICH COMPANY

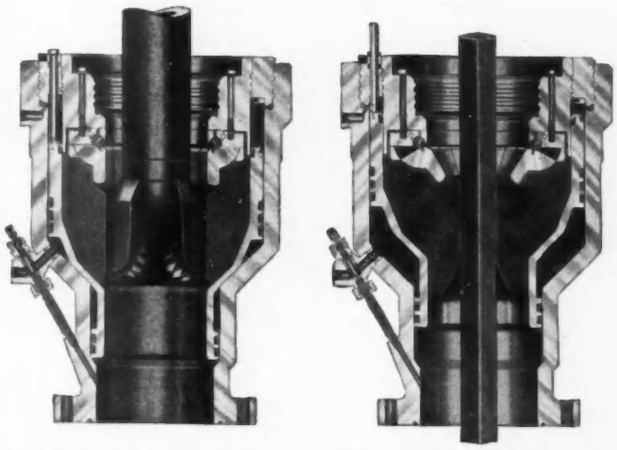
A paint to protect metal surfaces against chemical reactions, designated Koroplate, has been announced by The B. F. Goodrich Company, Akron, Ohio. It is designed to resist all acids except concentrated formic and acetic, and not to be affected by brass-, chrome-, nickel-, cadmium-, zinc-, copper-, silver- or tin-plating solutions.

Base of the paint is Koroseal, a synnethic material created from polyvinyl chloride, derived from coke, limestone and salt. The paint is liquid at room temperatures, and requires no heating before application. At ordinary temperatures it may be either brushed or sprayed, and can be thinned with either brush or spray thinners when necessary. It is made only in semi-glossy black, and must be used in conjunction with a Koroseal primer with similar characteristics.

Electric Logging

Lane-Wells Company, 5610 South Soto Street, Los Angeles, issued a bulletin, "Lane-Wells Electrolog," telling the story of electric logging of uncased hole. It is designed for use by oil com-

pany field personnel, and gives a description of the electrical characteristics of formations and of the different potential and resistivity curves used to make a complete well log. Typical electrolog records are shown from different oil producing areas. Electrolog applications to structural problems, completion problems, exploitation and production problems are discussed at length. Field equipment is illustrated and described, and diagrams explain the field set-up, and curve recording.



Type R blowout preventer, with bit shown at the left passing through packing unit without removal of parts, and, at right, packing unit sealing on a small member of the drill string.

Blowout Preventer

HYDRIL COMPANY

An addition to its line of Type R blowout preventers is offered by Hydril Company, 714 West Olympic Boulevard, Los Angeles. Designated No. 3 Size, it is designed for use as a primary blowout preventer and can be used with auxiliaries such as ram-type control equipment of all kinds as well as the larger models in the company's Type R line.

Packing units with bores of various sizes are supplied to give the pack-off range required by particular conditions. The packing unit with 10-inch bore is designed to allow the passage of bits and tools used in 11¾-inch casing, and will seal off around drill string members from 9⅞ to 3½ inches. When the packing unit with 8¾-inch bore is used, bits and other tools that will run inside of 9⅝-inch casing will pass through the blowout preventers, and the packing unit seals around drill string members as small as 2⅜ inches.

A reserve of material is provided in the packing unit to withstand wear occasioned by rotation of the kelly or drill pipe, and by stripping tool joints, casing protectors and other large-diameter portions of the drill string under pressure.

The blowout preventer head is equipped with lugs for attaching a special kelly packer. This assembly is designed to pack off either the square or hexagonal kelly, and to permit prolonged drilling under pressure without imposing undue wear on the packing unit of the blowout preventer.

Mixing Equipment

Eastern Engineering Company, 45 Fox Street, New Haven, Connecticut, has issued a new 24-page catalog describing and illustrating mixing equipment for industrial applications. One section has been devoted to engineering data on selection and adoption of mixing machinery, with discussions on power requirements, high versus low speed, single versus dual propellers, vertical versus side entering, mounting and similar topics. Included are descriptions of fluid mixers in all sizes and types, ranging from 1/1000- to 25-horsepower.

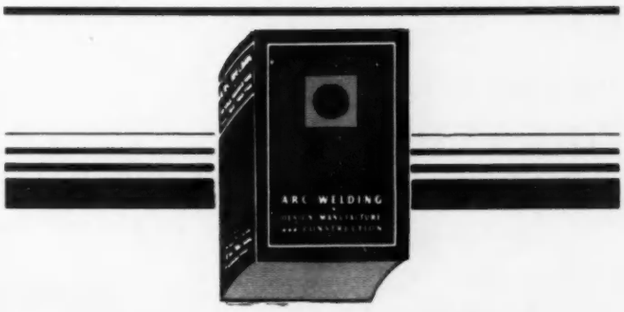
Insulating Flange

INDUSTRIAL ENGINEERING SERVICE

An insulating flange for pipe lines, designed to make unnecessary redrilling of the flanges before inserting the insulators, has been announced by Industrial Engineering Service, 310 Thompson Building, Tulsa.

The flanges, designated Wyaco, are made in sets for use on any fitting from 2- to 12-inch pipe size, and for use with flanges of series 200, 300, 400 and 600 pounds.

For new construction, the complete insulating flange joint, including steel flanges, can be furnished and correctly



ARC WELDING IN DESIGN, MANUFACTURE AND CONSTRUCTION

This book is a compilation of outstanding contributions in the recent $200,000 Award Program conducted by the James F. Lincoln Arc Welding Foundation, Cleveland, Ohio. Altogether the book contains 109 award papers.

This book provides scientific and technical schools, colleges and universities, engineering bodies and libraries, as well as industrial executives and officials, a tremendous volume of data on welding. The book will also be of incalculable value to designers, engineers, architects, production officials and others desirous of obtaining the benefits attributed to arc welded construction. All photographs and drawings essential to a clear and adequate presentation of each subject are included. Each study includes designs, calculations, procedures and other pertinent information showing how the advantages attributed to arc welded construction are obtained.

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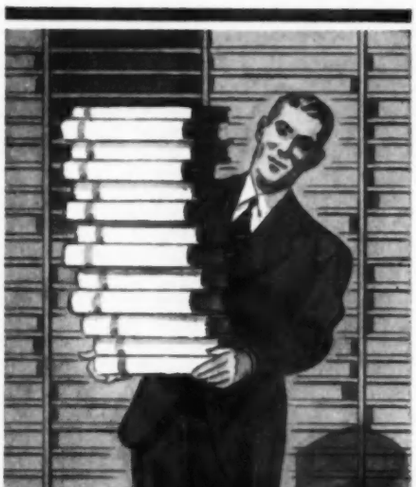

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PHOTOGRAPHIC MAPS
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ABSTRACT SERVICES

NOTES FOR THE Equipment Buyer and User

Wyaco Insulating Flange Assembly

assembled before shipment. In other applications, SAE 4140 bolts of sufficient tensile strength are employed to compensate for the decreased diameter, enabling the insulator tubes to go through a standard flange hole, and the bolt, in turn, to go through the tube.

V-Belt

THE CINCINNATI RUBBER MANUFACTURING COMPANY

A multiple V-belt, employing a heavy elastic fabric envelop to take up the outside wear and to permit ready flexing and give griping power, has been announced by The Cincinnati Rubber Manufacturing Company, Cincinnati, Ohio.

Load is carried by a section of high-tensile, low-stretch cords impregnated with liquid rubber and imbedded in a cushion of rubber to provide lengthwise flexibility and easy flexing around the pulleys.

Cincinnati Rubber's V-Belt

Uniform cross sections are designed to enable each belt to seat itself in the groove, and each belt is matched so that it will carry its equal share of the load. The belt is available in all sizes.

Coatings

Wailes Dove-Hermiston Corporation, Westfield, New Jersey, has issued a 20-page catalog describing its line of hot-applied bitumastic enamels, cold-applied bitumastic coatings, and industrial maintenance of paints, designed for protection of metal and concrete from corrosion or deterioration. A special section describes protective coatings for oil, gas and gasoline pipe lines, with illustrations showing their application.

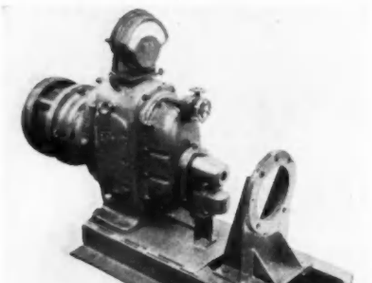
Test Rig

LINK-BELT COMPANY

A variable-speed test rig, combining a positive infinitely variable speed transmission and an adjustable mounting bracket on a welded steel base, and designed for testing generators, magnetos, governors, vibrators, pumps, springs, bearings and other specialized equipment, has been announced by Link-Belt Company, Philadelphia.

The rig is used to determine whether the equipment tested runs true, functions efficiently, carries the load properly, and for calibrating.

The mechanism to be tested is placed in position on a horizontally adjustable mounting bracket, moved up as required, and then connected to the variable-speed output shaft of the transmission. The bracket can be constructed to suit the design of the parts to be mounted and tested.



Variable Speed Test Rig

An electric tachometer and calibrated speed indicator positively driven from the variable-speed shaft provide the means for observing the speed at which the mechanism is being tested. Two

APPROVED SAFETY

JUSTRITE "TWIN-BULB" LANTERN

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APPROVED U. S. Bureau of Mines

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Pivots to any angle

See Page 1325 in COMPOSITE CATALOG, 1941

JUSTRITE MANUFACTURING CO.
2061 Southport **Chicago, Ill.**

controls are provided, direct hand wheel control and vernier control through a secondary hand wheel.

The instrument features all-metal construction and automatic lubrication.

Acquire Interest of Senseman in Paramount Equipment Company

L. A. Vandervoort and J. D. Redinbaugh, both active in the management of Paramount Equipment Company, 911 East First Street, Tulsa, have announced purchase of C. E. Senseman's interest in the firm. Principles and policies of the organization remain unchanged.

O'Neill Appoints Cavins As Mid-Continent Distributor

The Frank E. O'Neill Oil Field Service Company, Long Beach, California, has announced appointment of The Cavins Company, Long Beach, as Mid-Continent distributor for its line of swabs.

Oil-World Exposition Changes Show from 1942 to 1943

Postponement of the Oil-World Exposition, originally scheduled to be held in Houston in April, 1942, until April, 1943, was voted by the membership at a meeting held in Houston February 25. The vote of the membership followed a recommendation of the exposition's executive committee, as reported by John R. Suman, president.

Suman said that the Oil-World Exposition had hoped that The International Petroleum Exposition at Tulsa would agree to plans suggested by the Houston show for two expositions every four years, alternating between Houston and Tulsa, but that the International Petroleum Exposition would make no change from its announced plan of holding the International Petroleum Exposition on alternate years. Tulsa has an exposition scheduled for 1942, which would mean that if the Oil-World Exposition went ahead with its plans for a show in 1942, there would be two shows within a month of each other.

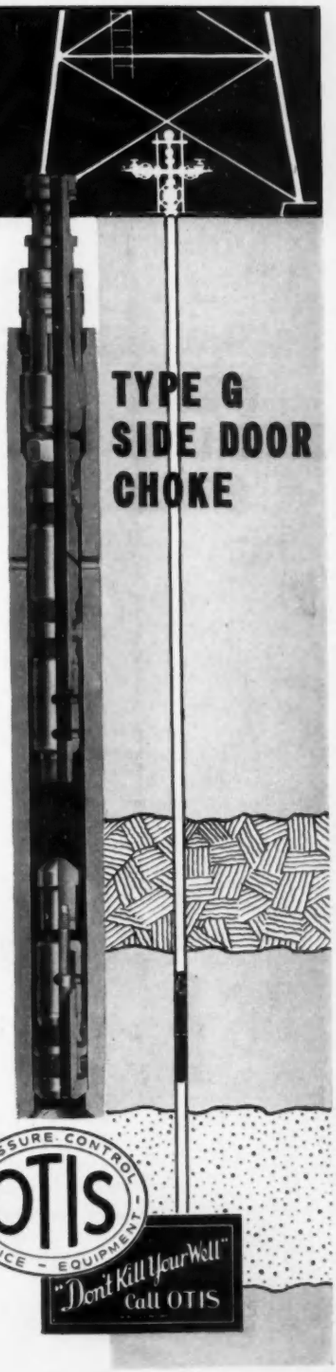
He also referred to the need for additional facilities for the Houston show, which had been promised by a previous city administration but plans for which could not be whipped into shape by 1942.

Added to this, he said, was a changed situation brought about by the war in Europe by America's defense program, and the probable advisability of concentrating on defense production rather than oil shows.

The membership voted unanimously to accept the recommendation of the executive committee to hold the next exposition in 1943. At a meeting of the executive committee which followed the membership meeting, the executive committee authorized the management of the exposition to give all manufacturers who had already signed for space in the 1942 exposition an invitation to extend their contracts to 1943. Between $45,000 and $50,000 worth of space had been signed for the 1942 show. After a 90-day period during which present contracts will be extended, and a membership drive completed to raise funds for the 1943 exposition administrative expense, the offices of the Oil-World Exposition will be closed and employes

2 from 1

PRODUCE FROM TWO ZONES WITH AN OTIS



TYPE G SIDE DOOR CHOKE

Produce from two zones independent of each other through the same string of tubing. It is dependable, simple and economical with the OTIS Type G Side Door Choke.

By equipping the choke with a perforated cup mandrel and blank bean, production may be had from the upper formation only. A blank cup mandrel and no bean will allow production from the lower formation only. Or if it is desired, regulated production may be had from both formations at same time.

A positive locking device securely holds choke in its seating nipple. Complete change may be made quickly by using an ordinary steel measuring line. Consult your nearest OTIS representative for full information on all sub-surface pressure controls.

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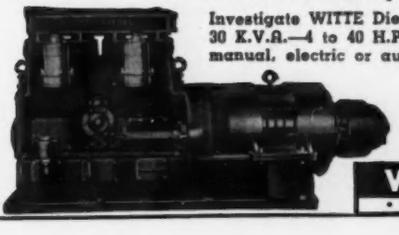

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removed from the payroll to avoid unnecessary expense.

At the membership meeting, directors were re-elected. Kenneth Slater, editor of The Petroleum Engineer, was made a director to succeed the late Clarence Morris, former publisher of the Petroleum Engineer.

All officers and members of the executive committee were re-elected by the board. They are: John R. Suman, president; Chase E. Sutton, executive vice president; J. S. Abercrombie, George A. Hill, W. L. Childs, and Wallace Wilson, vice presidents; Ray L. Dudley, secretary, and W. B. Sharpe, treasurer. The executive committee, in addition to the officers, includes Gordon Richmond, Frank Carothers, and Joe H. Russell.

Material Elevator

American Hoist & Derrick Company, St. Paul, Minnesota, has issued Bulletin 200-D-5, describing its portable material elevator. The equipment has a platform effective lift of 40 feet, with total height of its self-rising tower being 46½ feet.

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Letters to the Editors

DEAR SIRS:

Page 53, February 24 issue has a paragraph "Industry Flayed for Sales to Warring Fascist Nations."

Can you pick any flaws in the indictment?

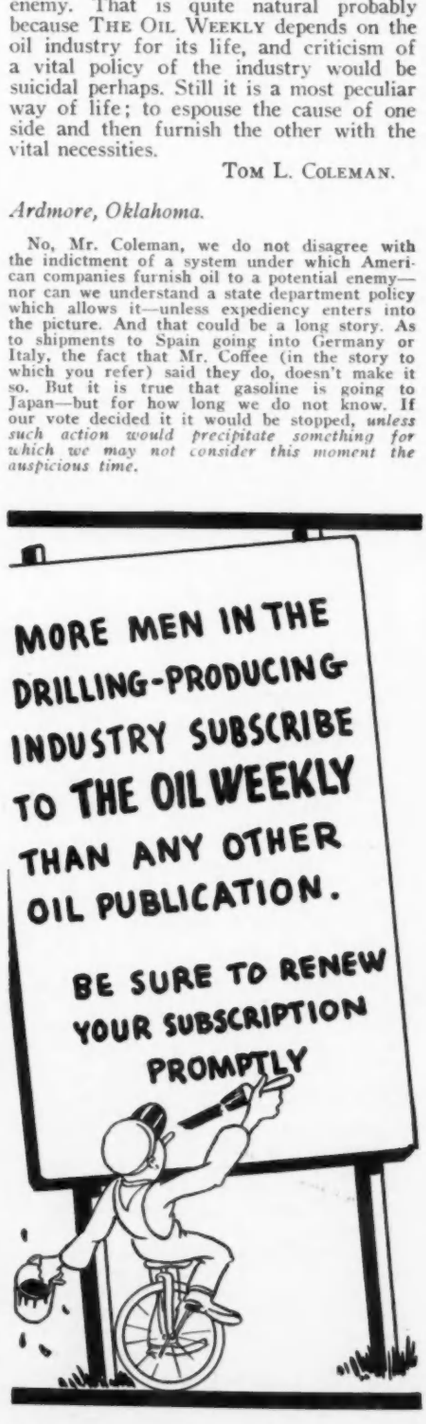
A good part of it, at least, is true; especially about the oil and gasoline to Japan.

THE OIL WEEKLY will claim that they are 100 percent American, and for defense, etc. Yet they do not make a protest against these sales of oil or gasoline to a potential enemy. That is quite natural probably because THE OIL WEEKLY depends on the oil industry for its life, and criticism of a vital policy of the industry would be suicidal perhaps. Still it is a most peculiar way of life; to espouse the cause of one side and then furnish the other with the vital necessities.

TOM L. COLEMAN.

Ardmore, Oklahoma.

No, Mr. Coleman, we do not disagree with the indictment of a system under which American companies furnish oil to a potential enemy—nor can we understand a state department policy which allows it—unless expediency enters into the picture. And that could be a long story. As to shipments to Spain going into Germany or Italy, the fact that Mr. Coffee (in the story to which you refer) said they do, doesn't make it so. But it is true that gasoline is going to Japan—but for how long we do not know. If our vote decided it it would be stopped, *unless such action would precipitate something for which we may not consider this moment the auspicious time.*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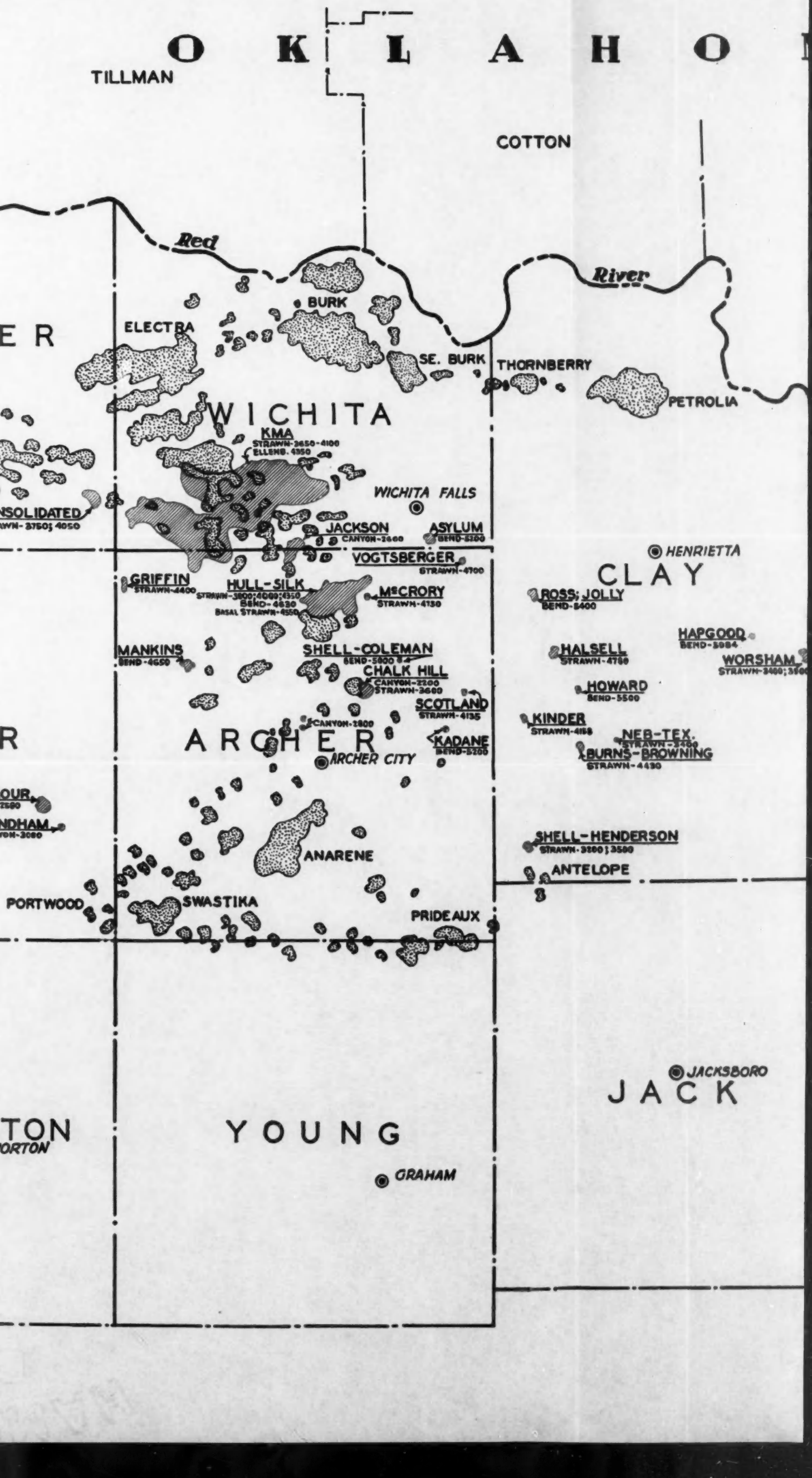

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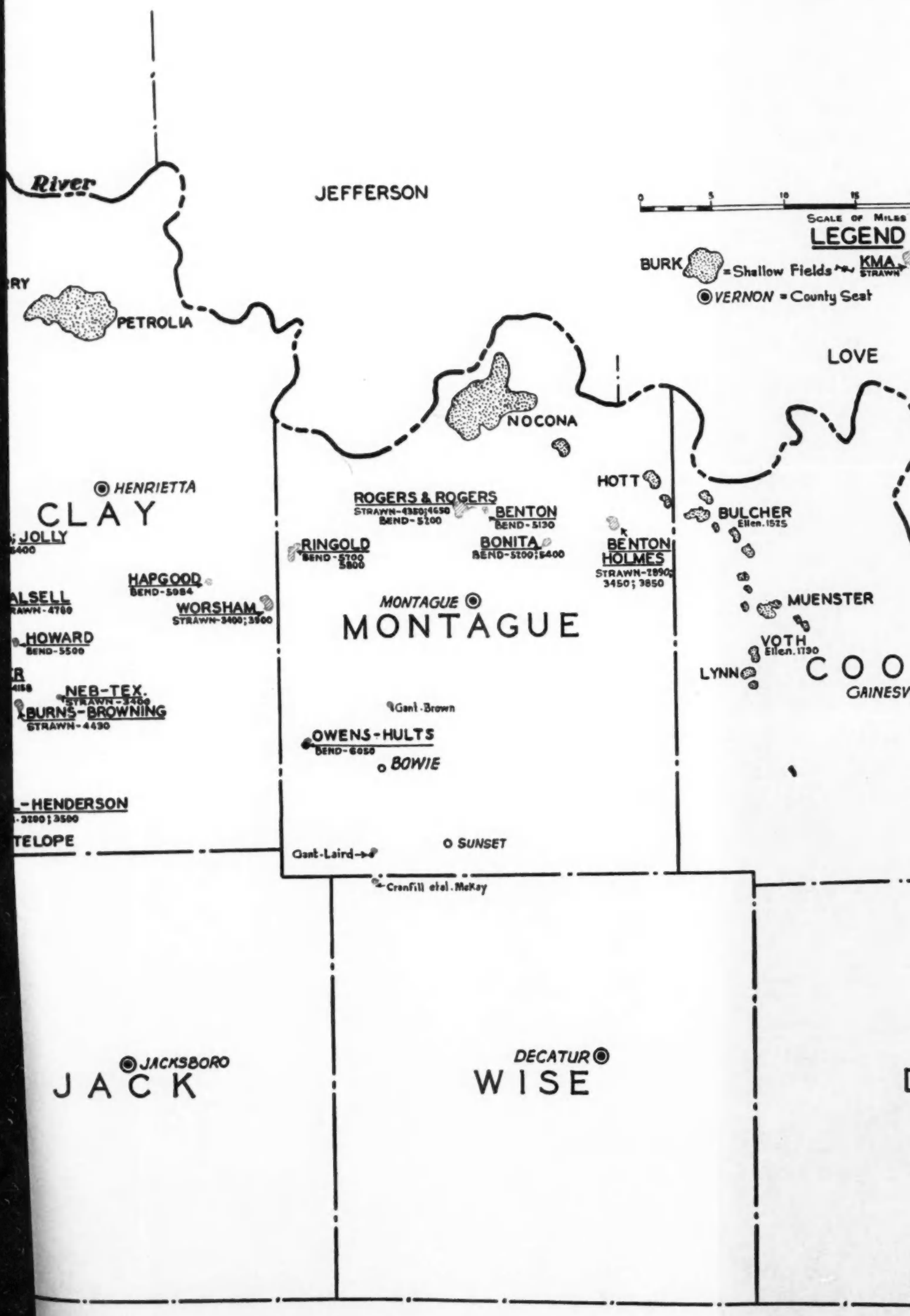

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Depth

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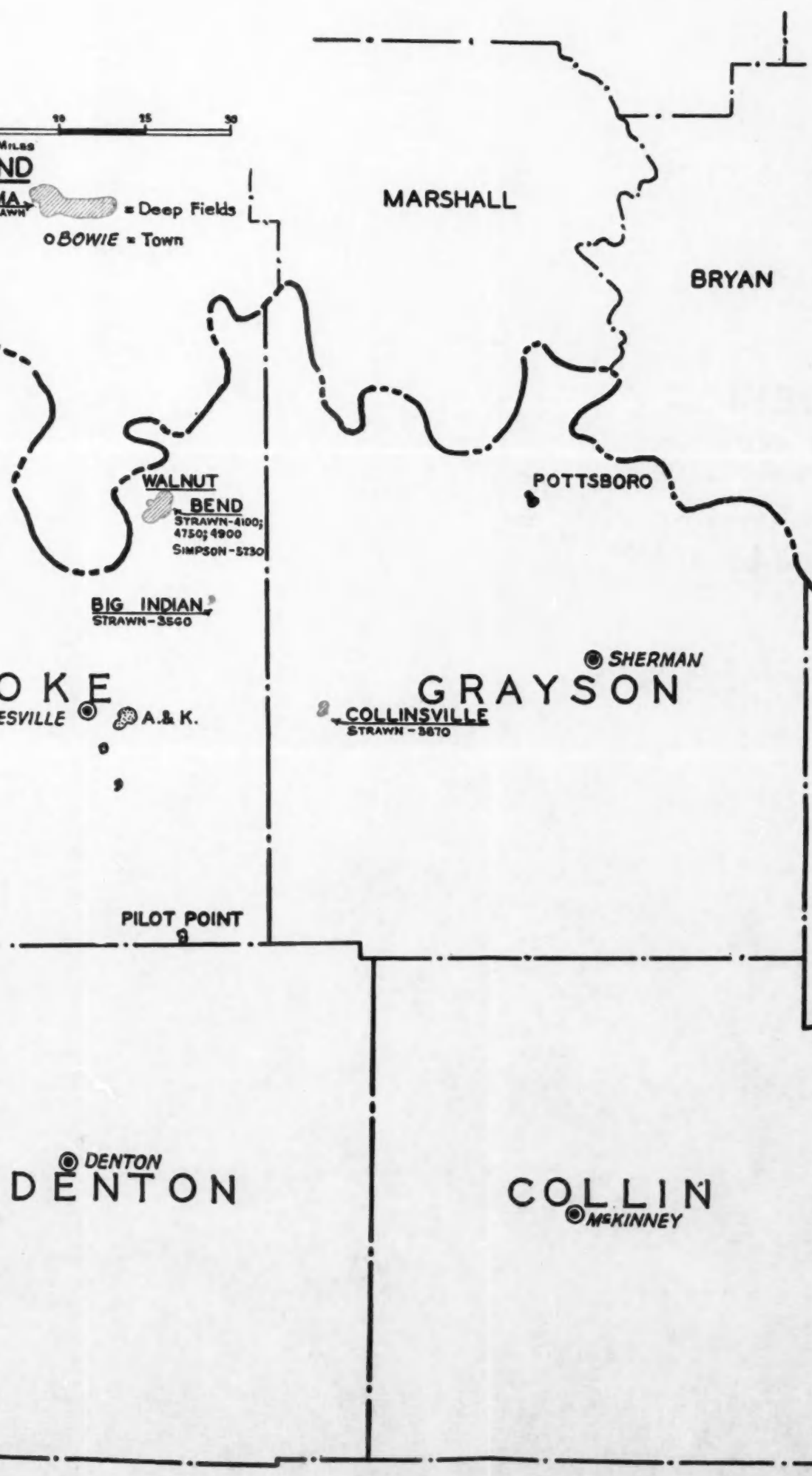

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PUBLISHERS OF SPECIALIZED OIL JOURNALS
HOUSTON, TEXAS

Readers of The OIL WEEKLY.

Gentlemen:

Again it is our pleasure to present the Annual Editorial Index to The OIL WEEKLY. All issues published during 1940 are indexed by subject matter on the following 14 pages.

To you, as a reader, the index constitutes a handy reference work on the economic trends and engineering progress in the Producing-Pipe Line Division of the Oil Industry for the past twelve months. We hope it will serve to refresh your memory from time to time of the important developments in your industry last year, and to assist you in keeping your oil field operations abreast with modern ideas.

To us, as publishers, the editorial index is our annual report of achievement and we are proud of our 1940 record. The index covers more than 3168 pages of strictly editorial data. Exclusive of general news, field developments, personal items, etc., it includes 347 special feature articles on over 100 different subjects; a material increase over the 266 special articles on 78 different subjects listed in our 1939 Annual Editorial Index. Moreover, a total of 132 different authors, 120 of which were actively associated with concerns engaged in the Producing-Pipe Line Divisions of the Oil Business itself, prepared the feature editorial contents that went into The OIL WEEKLY during 1940.

This editorial record would not be possible if it were not for our specialized publishing policy under which The OIL WEEKLY is devoted exclusively to the Producing-Pipe Line Industry; (our other publication, The Refiner, similarly covers the Refining Industry) our "planned in advance" editorial program; our fully manned and experienced editorial staff; and the generous cooperation of operating executives and engineers in the oil industry throughout the world.

Sincerely yours,

R. L. Dudley

Publisher.

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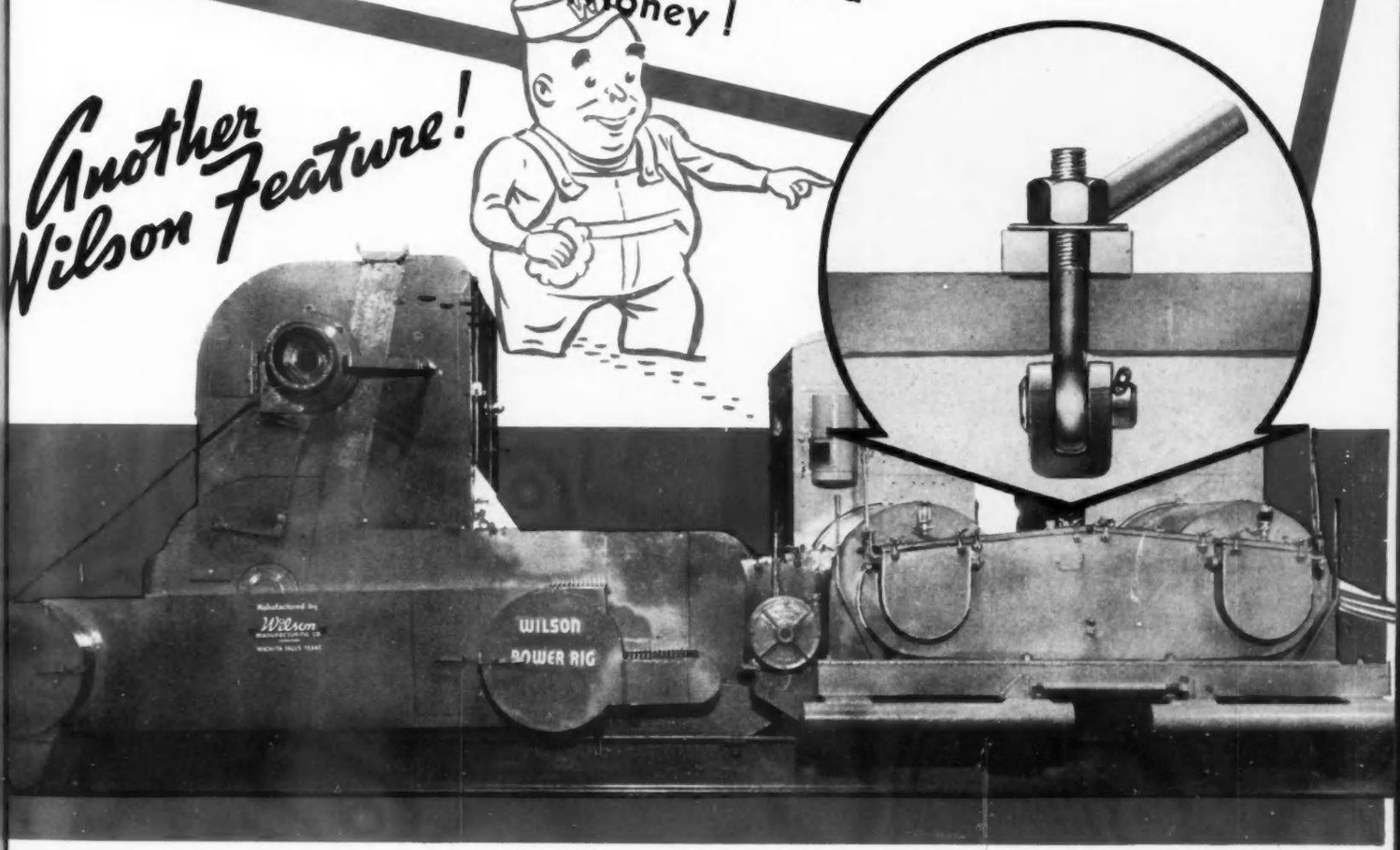

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